

SEQUENCE LISTING

<110> INSTITUT PASTEUR
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE - CNRS
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FERRIS, STEPHANE

<120> METHODS FOR OBTAINING THERMOSTABLE ENZYMES, DNA POLYMERASE I VARIANTS FROM THERMUS AQUATICUS HAVING NEW CATALYTIC ACTIVITIES, METHODS FOR OBTAINING THE SAME, AND APPLICATIONS OF THE SAME

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<150> US 10/787,219
<151> 2004-02-27

<160> 106

<170> PatentIn version 3.3

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Ala Leu Glu Glu Ala Pro Trp Pro Pro Glu Gly Ala Phe Val Gly
20 25 30

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg 143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
35 40 45

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Ala Ala Ala Arg Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
50 55 60

gcc ctc agg gac ctg aag gag gc^g cg^g ggg ctt ctc gcc aaa gac ctg 239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
65 70 75

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc cc^g ccc ggc gac gac 287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
80 85 90 95

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
100 105 110

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Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu
115 120 125

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Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu
130 135 140

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Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val	Glu	Arg	Pro	
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ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg	cgc	ctg	gac	527
Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val	Arg	Leu	Asp	
160		165								170				175		
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Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu	Leu	Gly	Leu	
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ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	acc	agc	gcc	719
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225		230									235					
gcc	gtc	ctg	gag	gcc	ctt	cgc	gag	gcc	cac	ccc	atc	gtg	gag	aag	atc	767
Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val	Glu	Lys	Ile	
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Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr	Ile	Gly	Pro	
260		265									270					
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Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His	Thr	Arg	Phe	
275		280									285					
aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	agc	tcc	gat	ccc	aac	911
Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser	Ser	Asp	Pro	
290		295									300					
ctc	cag	aac	gtc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	atc	cgc	cgg	959
Leu	Gln	Asn	Val	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg	Ile	Arg	Arg	
305		310									315					
gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg	gac	tat	agc	1007
Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu	Asp	Tyr	Ser	
320		325									330			335		
cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac	gag	aac	ctg	1055
Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp	Glu	Asn	Leu	

340	345	350																
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Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu	Thr	Ala	Ser			
355									360							365		
tgg	atg	ttc	ggc	gtc	ccc	cgg	gag	gcc	gtg	gac	ccc	ctg	atg	cgc	cgg		1151	
Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu	Met	Arg	Arg			
370									375							380		
gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg	tcg	gcc	cac		1199	
Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met	Ser	Ala	His			
385									390							395		
cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc	cag	gcc	ttc		1247	
Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala	Gln	Ala	Phe			
400									405							410		415
att	gag	cgc	tac	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc	tgg	att	gag		1295	
Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala	Trp	Ile	Glu			
420									425							430		
aag	acc	ctg	gag	gag	ggt	agg	agg	cgg	ggg	tac	gtg	gag	acc	ctc	ttc		1343	
Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Gly	Arg	Gly	Tyr	Val	Glu	Thr	Leu	Phe		
435									440							445		
ggc	cgc	cgc	cgc	tac	gtg	cca	gac	cta	gag	gcc	cgg	gtg	aag	agc	gtg		1391	
Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val	Lys	Ser	Val			
450									455							460		
cgg	gag	gag	gcc	gag	cgc	atg	gcc	ttc	aac	atg	ccc	gtc	cag	ggc	acc		1439	
Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro	Val	Gln	Gly	Thr			
465									470							475		
gcc	gcc	gac	ctc	acg	aag	ctg	gct	atg	gtg	aag	ctc	ttc	ccc	agg	ctg		1487	
Ala	Ala	Asp	Leu	Thr	Lys	Leu	Ala	Met	Val	Lys	Leu	Phe	Pro	Arg	Leu			
480									485							490		495
gag	gaa	atg	ggg	gcc	agg	atg	ctc	ctt	cag	gtc	cac	gac	gag	ctg	gtc		1535	
Glu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His	Asp	Glu	Leu	Val			
500									505							510		
ctc	gag	gcc	cca	aaa	gag	ggg	gcg	gag	gcc	gtg	gcc	cgg	ctg	gcc	aag		1583	
Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg	Leu	Ala	Lys			
515									520							525		
gag	gtc	atg	gag	ggg	gtg	tat	ccc	ctg	gcc	gtg	ccc	ctg	gag	gtg	gag		1631	
Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	Leu	Glu	Val	Glu			
530									535							540		
gtg	ggg	ata	ggg	gag	gac	tgg	ctc	tcc	gcc	aag	gag	gcg	gcc	gca	ctg		1679	

Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu
545 550 555

gtg ccg cgc 1688
Val Pro Arg
560

<210> 20
<211> 562
<212> PRT
<213> Thermus aquaticus

<400> 20

Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys Ala
1 5 10 15

Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Gly Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Val Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Thr Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
530 535 540

Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
545 550 555 560

Pro Arg

<210> 21
<211> 1688
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (3) .. (1688)

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<400> 21
cc atg gcc tct ggt ggc ggt ggc tgt ggt ggc ggt ggc agc ccc aag      47
    Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys
    1          5                  10                 15

```

```

gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc      95
Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly
20          25          30

```

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg 143
 Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
 35 40 45

gcc gcc gcc agg ggg ggc cg_g gtc cac cg_g gcc ccc gag cct tat aaa 191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
50 55 60

gcc ctc agg gac ctg aag gag ggc cgcc ggg ctt ctc gcc aaa gac ctg 239
 Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu,
 65 70 75

```

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac      287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
80          85          90          95

```

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
 Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
 100 105 110

ggg gtg gcc cg^g cgc tac ggc ggg gag tgg acg gag gag g^cg ggg gag 383
 Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu
 115 120 125

cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt 431
 Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu

130	135	140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro 145 150 155			479
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp 160 165 170 175			527
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala 180 185 190			575
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu 195 200 205			623
aac tcc cggt gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu 210 215 220			671
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala 225 230 235			719
gcc gtc ctg ggg gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc Ala Val Leu Gly Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240 245 250 255			767
ctg cag tac cgg gag ctc acc aag ctg aag acg acc tac att gac ccc Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro 260 265 270			815
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe 275 280 285			863
aac cag acg gcc acg gcc acg ggc agg cta agt acg tcc gat ccc aac Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290 295 300			911
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg 305 310 315			959
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg acc ctg gac tat acg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Thr Leu Asp Tyr Ser 320 325 330 335			1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg			1055

Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp	Glu	Asn	Leu		
									345						350		
atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag	acc	gcc	agc	1103	
Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu	Thr	Ala	Ser		
				355					360			365					
tgg	atg	ttc	ggc	gtc	ccc	cgg	gag	gcc	gtg	gac	ccc	ctg	atg	cgc	cgg	1151	
Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu	Met	Arg	Arg		
				370			375					380					
gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg	tcg	gcc	cac	1199	
Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met	Ser	Ala	His		
				385			390				395						
cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gcc	cag	gcc	ttc		1247	
Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala	Gln	Ala	Phe		
				400			405			410			415				
att	gag	cgc	tac	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc	tgg	att	gag	1295	
Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala	Trp	Ile	Glu		
				420			425					430					
aag	acc	ctg	gag	gag	ggc	agg	agg	cgg	ggg	tac	gtg	gag	acc	ctc	ttc	1343	
Lys	Thr	Leu	Glu	Gly	Arg	Arg	Gly	Arg	Arg	Gly	Tyr	Val	Glu	Thr	Leu	Phe	
				435			440					445					
ggc	cgc	cgc	cgc	tac	gtg	cca	gac	cta	gag	gcc	cgg	gtg	aag	agc	gtg	1391	
Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val	Lys	Ser	Val		
				450			455					460					
cgg	gag	gcf	gcc	gag	cgc	atg	gcc	ttc	aac	atg	ccc	gtc	cag	ggc	acc	1439	
Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro	Val	Gln	Gly	Thr		
				465			470			475							
gcc	gcc	gac	ctc	atg	aag	ctg	gct	atg	gtg	aag	ctc	ttc	ccc	agg	ctg	1487	
Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	Phe	Pro	Arg	Leu		
				480			485			490			495				
gag	gaa	atg	ggg	gcc	agg	atg	ctc	ctt	cag	gtc	cac	gac	gag	ctg	gtc	1535	
Glu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His	Asp	Glu	Leu	Val		
				500			505					510					
ctc	gag	gcc	cca	aaa	gag	ggg	gcf	gag	gcc	gtg	gcc	cgg	ctg	gcc	aag	1583	
Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg	Leu	Ala	Lys		
				515			520					525					
gag	gtc	atg	gag	ggg	gtg	tat	ccc	ctg	gcc	gtg	ccc	ctg	gag	gtg	gag	1631	
Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	Leu	Glu	Val	Glu		
				530			535					540					

gtg ggg ata ggg gag gac agg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

<210> 22
 <211> 562
 <212> PRT
 <213> Thermus aquaticus

<400> 22

Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys Ala
 1 5 10 15

Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
 115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
 130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Gly Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Thr Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
530 535 540

Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu Val

545 550 555 560

Pro Arg

<210> 23
<211> 1688
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (3)..(1688)

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<400> 23
cc atg gcc tct ggt ggc ggt ggc tgt ggt ggc ggt ggc agc ccc aag      47
  Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys
   1           5                  10                   15

```

gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc
 Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly
 20 25 30

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg 143
 Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
 35 40 45

gcc gcc gcc agg ggg ggc cg^g gtc cac cg^g gcc ccc gag cct tat aaa 191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
50 55 60

```

gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg      239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
   65           70           75

```

```

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac      287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
80          85           90          95

```

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
 Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
 100 105 110

ggg gtg gcc cg^c tac ggc ggg gag tgg acg gag gag gc^g ggg gag 383
 Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu
 115 120 125

cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt 431

Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu			
130	135	140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc			479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro			
145	150	155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac			527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp			
160	165	170	175
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc			575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala			
180	185	190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc caa ctc			623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Gln Leu			
195	200	205	
aac caa cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt			671
Asn Gln Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu			
210	215	220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc			719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala			
225	230	235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc			767
Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile			
240	245	250	255
ctg cag tac cgg gag ctc aac aag ctg aag acg acc caa att act cag			815
Leu Gln Tyr Arg Glu Leu Asn Lys Leu Lys Ser Thr Gln Ile Thr Gln			
260	265	270	
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc			863
Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe			
275	280	285	
aac cag acg gcc acg caa acg ggc agg cta agt acg tcc cag ccc aac			911
Asn Gln Thr Ala Thr Gln Thr Gly Arg Leu Ser Ser Ser Gln Pro Asn			
290	295	300	
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg			959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg			
305	310	315	
acc ttc atc gcc gag gag ggg agg cta ttg gtg gcc ctg gac tat aac			1007
Thr Phe Ile Ala Glu Glu Gly Arg Leu Leu Val Ala Leu Asp Tyr Asn			
320	325	330	335

cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340	345	350	1055
atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355	360	365	1103
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370	375	380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385	390	395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400	405	410	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420	425	430	1295
aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe 435	440	445	1343
ggc cgc cgc tac ctg cca gac cta gag gcc cag gtg aag aat gtg Gly Arg Arg Tyr Leu Pro Asp Leu Glu Ala Gln Val Lys Asn Val 450	455	460	1391
cgg gag gcg gcc gag cgc agg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val Gln Gly Thr 465	470	475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu 480	485	490	1487
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val 500	505	510	1535
ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys 515	520	525	1583
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg cct ctg gag gtg gag Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu 530	535	540	1631

gtg	ggg	ata	ggg	gag	gac	tgg	ctc	tcc	gcc	aag	gag	gcg	gcc	gca	ctg	1679
Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	Ala	Ala	Ala	Leu	
545							550					555				
gtg	ccg	ccg														1688
Val	Pro	Arg														
560																
<210>	24															
<211>	562															
<212>	PRT															
<213>	Thermus aquaticus															
<400>	24															
Met	Ala	Ser	Gly	Gly	Gly	Gly	Cys	Gly	Gly	Gly	Gly	Ser	Pro	Lys	Ala	
1				5				10						15		
Leu	Glu	Glu	Ala	Pro	Trp	Pro	Pro	Pro	Glu	Gly	Ala	Phe	Val	Gly	Phe	
20					25								30			
Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu	Leu	Ala	Leu	Ala	
35						40							45			
Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu	Pro	Tyr	Lys	Ala	
50						55							60			
Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala	Lys	Asp	Leu	Ser	
65				70					75					80		
Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro	Gly	Asp	Asp	Pro	
				85					90					95		
Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr	Thr	Pro	Glu	Gly	
				100				105					110			
Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu	Ala	Gly	Glu	Arg	
				115				120					125			
Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp	Gly	Arg	Leu	Glu	
						130			135				140			

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Gln Leu Asn
195 200 205

Gln Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Asn Lys Leu Lys Ser Thr Gln Ile Thr Gln Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Gln Thr Gly Arg Leu Ser Ser Ser Gln Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Thr
305 310 315 320

Phe Ile Ala Glu Glu Gly Arg Leu Leu Val Ala Leu Asp Tyr Asn Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile

340

345

350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Leu Pro Asp Leu Glu Ala Gln Val Lys Asn Val Arg
450 455 460

Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
530 535 540

Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 25
<211> 1688
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (3)..(1688)

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  Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys
    1          5                  10                 15

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ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg
 Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
 35 40 45

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gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa      191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
      50           55           60

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gcc ctc agg gac ctg aag gag gcg cg_g ggg ctt ctc gcc aaa gac ctg 239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
65 70 75

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agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac      287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
80          85           90           95

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ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
100 105 110

ggg gtg gcc cg^c tac ggc gag tgg acg gag gag g^c ggg gag 383
 Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu
 115 120 125

cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt		431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu		
130	135	140
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc		479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro		
145	150	155
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac		527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp		
160	165	170
175		
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc		575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala		
180	185	190
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc		623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu		
195	200	205
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt		671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu		
210	215	220
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc		719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala		
225	230	235
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc		767
Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile		
240	245	250
255		
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc		815
Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro		
260	265	270
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc		863
Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe		
275	280	285
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac		911
Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn		
290	295	300
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg		959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg		
305	310	315
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc		1007
Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser		
320	325	330
335		

cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445	1343
ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu 480 485 490 495	1487
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val 500 505 510	1535
ctc gag gcc cca aaa gag agg gcg gag gcc gtg gcc cgg ctg gcc aag Leu Glu Ala Pro Lys Glu Arg Ala Glu Ala Val Ala Arg Leu Ala Lys 515 520 525	1583
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu	1631

530

535

540

gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

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<212> PRT
<213> Thermus aquaticus

<400> 26

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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
 115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu

130

135

140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Ile Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Arg Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
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Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
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Pro Arg

<210> 27
<211> 1688
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (3)..(1688)

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    Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys
    1           5                   10                  15

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gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc
 Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly
 20 25 30

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg 143
 Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
 35 40 45

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gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa      191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
      50          55          60

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gcc ctc agg gac ctg aag gag gcg cg^g ggg ctt ctc gcc aaa gac ctg 239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
65 70 75

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac 287
 Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leú Pro Pro Gly Asp Asp
 80 85 90 95

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
 Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
 100 105 110

ggg gtg gcc cg^c cgc tac ggc ggg gag tgg acg gag gag gc^c ggg gag 383
 Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu
 115 120 125

cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cg ^g gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
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ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gtc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767
Val Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile	
240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc	815
Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro	
260 265 270	
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc	863
Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe	
275 280 285	
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac	911
Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn	
290 295 300	
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg	959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg	
305 310 315	
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc	1007
Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser	

320	325	330	335	
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tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380				1151
gcg gcc aag agc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Ser Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395				1199
cgccctcc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415				1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430				1295
aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445				1343
ggccgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460				1391
cgaggcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475				1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc tcc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Ser Pro Arg Leu 480 485 490 495				1487
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val 500 505 510				1535
ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys 515 520 525				1583
gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag				1631

Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu
 530 535 540

gtg ggg ata ggg gag gac cgg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

<210> 28
 <211> 562
 <212> PRT
 <213> Thermus aquaticus

<400> 28

Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys Ala
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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
 115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Val
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Ser Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Ser Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
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Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 29
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 <213> Thermus aquaticus

<220>
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 <222> (3)..(1688)

<400> 29

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gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc	95
Ala Leu Glu Glu Ala Pro Trp Pro Pro Glu Gly Ala Phe Val Gly	
20 25 30	

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg	143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu	
35 40 45	

gcc gcc gcc agg ggg ggc cggt ctc cac ccg gcc ccc gag cct tat aaa	191
Ala Ala Ala Arg Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys	
50 55 60	

gcc ctc agg gac ctg aag gag gcg ccg ggg ctt ctc gcc aaa gac ctg	239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu	
65 70 75	

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac	287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp	
80 85 90 95	

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag	335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu	
100 105 110	

ggg gtg gcc ccg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Glu Trp Thr Glu Glu Ala Gly Glu	

115

120

125

cg_g g_c g_c c_t t_c g_a g_g c_t c_t g_c a_a c_t g_t t_g g_g g_g a_g c_t t_t
 Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu
 130 135 140 431

g_a g_g g_g g_g g_g a_g c_t c_t t_g c_t t_a c_g g_a g_t g_g a_g c_c
 Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro
 145 150 155 479

c_t t_c g_c g_t c_t g_c c_a c_t g_a g_c a_c g_g g_t c_g c_t g_a
 Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp
 160 165 170 175 527

g_t g_c t_a t_c a_g g_c t_t g_c c_t g_a g_t g_c g_a g_g a_t c_g
 Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala
 180 185 190 575

c_g c_t g_a g_c g_g g_t c_t c_g c_t g_c g_g c_a c_c t_t a_a c_t
 Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu
 195 200 205 623

a_a t_c c_g g_a c_a g_c c_t g_a a_g g_t c_t t_t g_a c_g c_t a_g g_g c_t
 Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu
 210 215 220 671

c_c g_c a_t c_g c_a a_a g_a c_g g_a a_a g_c a_a g_c t_c a_c c_a g_c
 Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala
 225 230 235 719

g_c g_t c_t g_a g_c c_t c_g g_a g_c c_a c_c a_t c_t g_t g_a a_a g_t a_t
 Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile
 240 245 250 255 767

c_t g_c a_a c_t c_g g_a g_c c_t a_c a_a g_t a_a g_c a_c t_a c_t a_t t_t g_a c_{cc}
 Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro
 260 265 270 815

t_t g_c g_a c_t a_t c_a c_c a_g g_c a_c g_g c_g c_t c_a c_a c_c t_t
 Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe
 275 280 285 863

a_a c_a g_a c_g g_t a_c g_c a_c g_g a_g c_t a_g t_c g_a t_c c_c a_a
 Asn Gln Thr Val Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn
 290 295 300 911

c_t c_a g_a a_a c_t c_{cc} g_t c_g a_c c_{cg} c_{tt} g_{gg} c_a g_g a_g a_t c_{cg} c_{gg}
 Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg
 305 310 315 959

g_c t_t a_t c_g g_c g_a g_g t_g g_a t_t g_t g_c c_t g_a c_t a_t a_g
 1007

Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser
 320 325 330 335

cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg 1055
 Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu
 340 345 350

atc cgg gtc ttc cag gag ggg cg^g gac atc cac acg gag acc gcc agc 1103
 Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser
 355 360 365

tgg atg ttc ggc gtc ccc cg^g gag gcc gtg gac ccc ctg atg Cgc cg^g 1151
 Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg
 370 375 380

gc^g gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac 1199
 Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His
 385 390 395

cg^c ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc 1247
 Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe
 400 405 410 415

att gag cg^c tac ttt cag agc ttc ccc aag gtg cg^g gcc tgg att gag 1295
 Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu
 420 425 430

aag acc ctg gag gag ggc agg agg cg^g ggg tac gtg gag acc ctc ttc 1343
 Lys Thr Leu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe
 435 440 445

gg^c cg^c cg^c tac gtg cca gac cta gag gcc cg^g gtg aag agc gtg 1391
 Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val
 450 455 460

cg^g gag gc^c gag cg^c atg gcc tac aac atg ccc gtc cag gg^c acc 1439
 Arg Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr
 465 470 475

gg^c gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg 1487
 Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu
 480 485 490 495

gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc 1535
 Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val
 500 505 510

ctc gag gcc cca aaa gag ggg gc^g gag gcc gtg gcc cg^g ctg gcc aag 1583
 Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys
 515 520 525

gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag 1631
 Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu
 530 535 540

gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

<210> 30
 <211> 562
 <212> PRT
 <213> Thermus aquaticus

<400> 30

Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys Ala
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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
 115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Val Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val

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Pro Arg			
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Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys			
1	5	10	15
gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg .gcc ttc gtg ggc			95
Ala Leu Glu Glu Ala Pro Trp Pro Pro Glu Gly Ala Phe Val Gly			
20	25	30	
ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg			143
Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu			
35	40	45	
gcc gcc gcc agg ggg ggc cggt gtc cac ccg gcc ccc gag cct tat aaa			191
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys			
50	55	60	
gcc ctc agg gac ctg aag gag gcg ccg ggg ctt ctc gcc aaa gac ctg			239
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu			
65	70	75	
agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac			287
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp			
80	85	90	95
ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag			335
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu			
100	105	110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag			383

Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu			
115	120	125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt			431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu			
130	135	140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc			479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro			
145	150	155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac			527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp			
160	165	170	175
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc			575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala			
180	185	190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc			623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu			
195	200	205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt			671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu			
210	215	220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc			719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala			
225	230	235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc			767
Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile			
240	245	250	255
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc			815
Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro			
260	265	270	
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc			863
Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe			
275	280	285	
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac			911
Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn			
290	295	300	
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg			959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg			
305	310	315	

gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser 355 360 365	1103
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gct gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445	1343
ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu 480 485 490 495	1487
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val 500 505 510	1535
ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys 515 520 525	1583

gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gtg gag 1631
 Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu
 530 . 535 . 540

gtg ggg ata ggg gag gac cg^g ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 . 550 . 555

gtg ccg cgc 1688
 Val Pro Arg
 560

<210> 32
<211> 562
<212> PRT
<213> Thermus aquaticus

<400> 32

Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys Ala
 1 . 5 . 10 . 15

Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 . 25 . 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 . 40 . 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 . 55 . 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 . 70 . 75 . 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 . 90 . 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 . 105 . 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
 115 . 120 . 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln

325

330

335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
 530 535 540

Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
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Pro Arg

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 <212> DNA
 <213> Thermus aquaticus

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 Met Ala Ser Gly Gly Gly Cys Gly Gly Ser Pro Lys
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gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc 95
 Ala Leu Glu Glu Ala Pro Trp Pro Pro Glu Gly Ala Phe Val Gly
 20 25 30

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg 143
 Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
 35 40 45

gcc gcc gcc agg ggg ggc cggt gtc cac ccg gcc ccc gag cct tat aaa 191
 Ala Ala Ala Arg Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
 50 55 60

gcc ctc agg gac ctg aag gag gcg ccg ggg ctt ctc gcc aaa gac ctg 239
 Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
 65 70 75

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac 287
 Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
 80 85 90 95

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
 Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
 100 105 110

ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg acg gag gag g ^c ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cg ^g gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cg ^g gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cg ^c ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767
Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile	
240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc	815
Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro	
260 265 270	
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc	863
Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe	
275 280 285	
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac	911
Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn	
290 295 300	
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg	959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg	
305 310 315	

gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser 320 325 330 335	1007
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu 340 345 350	1055
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tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgcc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg 370 375 380	1151
gcu gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His 385 390 395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe 400 405 410 415	1247
att gag cgc tac ttt ctg agc ttc ccc aag gtg cgcc gac tgg att gag Ile Glu Arg Tyr Phe Leu Ser Phe Pro Lys Val Arg Ala Trp Ile Glu 420 425 430	1295
aag acc ctg gag gaa ggc agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe 435 440 445	1343
ggc cgc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val 450 455 460	1391
cgg gag gcg gcc gag cgc aag gcc ttc aac atg ccc gtc cag ggc acc Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val Gln Gly Thr 465 470 475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu 480 485 490 495	1487
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val 500 505 510	1535
ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg ctg gcc aag Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys	1583

515

520

525

gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ctc ctg gag gtg gag 1631
 Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Leu Leu Glu Val Glu
 530 535 540

gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

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<212> PRT
<213> Thermus aquaticus

<400> 34

Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys Ala
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Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
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Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg

115

120

125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Leu Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Leu Leu Glu Val Glu Val
530 535 540

Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 35
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<220>
<221> CDS
<222> (3)..(1688)

<400> 35

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    Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly Ser Pro Lys
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47

```

gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc
Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly
                           20                      25                      30

```

95

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg
 Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
 35 40 45

143

```

gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa
Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
      50          55          60

```

191

gcc ctc agg gac ctg aag gag gcg cg_g ggg ctt ctc gcc aaa gac ctg
Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
65 70 75

239

```

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac
Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
80          85          90          95

```

287

```

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag
Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu
                           100                      105                      110

```

335

ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag	383
Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu	
115 120 125	
cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt	431
Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu	
130 135 140	
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc	479
Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro	
145 150 155	
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac	527
Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp	
160 165 170 175	
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc	575
Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala	
180 185 190	
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc	623
Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu	
195 200 205	
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt	671
Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu	
210 215 220	
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc	719
Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala	
225 230 235	
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc	767
Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile	
240 245 250 255	
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc	815
Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro	
260 265 270	
ttg cag gac ctc atc cac ccc agt acg ggc cgc ctc cac acc cgc ttc	863
Leu Gln Asp Leu Ile His Pro Ser Thr Gly Arg Leu His Thr Arg Phe	
275 280 285	
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac	911
Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn	
290 295 300	
ctc cag aac atc ccc gtc cgc acc Ccg ctt ggg cag agg atc cgc cgg	959
Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg	

305	310	315	
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser	320 325	330	1007 335
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu	340	345	1055 350
atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag acc gcc agc Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser	355	360	1103 365
tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg atg cgc cgg Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg	370	375	1151 380
gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His	385 390	395	1199
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe	400 405	410	1247 415
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu	420	425	1295 430
aag acc cta gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc Lys Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe	435 440	445	1343
ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gag Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Glu	450 455	460	1391
cg ^g gag gc ^g gcc gag cg ^c atg gc ^c tac aac atg ccc gtc cag gg ^c acc Arg Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr	465 470	475	1439
gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc ccc agg ctg Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu	480 485	490	1487 495
gag gaa atg ggg gc ^c cg ^c atg ctc ctt cag gtc cac gac gag ctg gtc Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val	500	505	1535 510
ctc gag gcc cca aaa gag ggg gc ^c gag gc ^c gtg gcc cg ^c ctg gc ^c aag			1583

Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys
 515 520 525

gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg gag gcg gag 1631
 Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Ala Glu
 530 535 540

gtg ggg ata ggg gag gat tgg ctc tcc gcc aag gag gcg gcc gca ctg 1679
 Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu
 545 550 555

gtg ccg cgc 1688
 Val Pro Arg
 560

<210> 36

<211> 562

<212> PRT

<213> Thermus aquaticus

<400> 36

Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys Ala
 1 5 10 15

Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala Phe Val Gly Phe
 20 25 30

Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu Ala
 35 40 45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala
 50 55 60

Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu Ser
 65 70 75 80

Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp Pro
 85 90 95

Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu Gly
 100 105 110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Gln Asp Leu Ile His Pro Ser Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Glu Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu
515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Ala Glu Val
 530 535 540

Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
 545 550 555 560

Pro Arg

<210> 37
 <211> 1688
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (3)..(1688)

<400> 37
 cc atg gcc tct ggt ggc ggt tgt ggt ggc ggt ggc agc ccc aag 47
 Met Ala Ser Gly Gly Gly Cys Gly Gly Gly Ser Pro Lys
 1 5 10 15

gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc ttc gtg ggc 95
 Ala Leu Glu Ala Pro Trp Pro Pro Glu Gly Ala Phe Val Gly
 20 25 30

ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt ctg gcc ctg 143
 Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu Leu Ala Leu
 35 40 45

gcc gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag cct tat aaa 191
 Ala Ala Ala Arg Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys
 50 55 60

gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc aaa gac ctg 239
 Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala Lys Asp Leu
 65 70 75

agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc ggc gac gac 287
 Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro Gly Asp Asp
 80 85 90 95

ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc acc ccc gag 335
 Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr Thr Pro Glu

100	105	110	
ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag gcg ggg gag Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu 115	120	125	383
cg ^g gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg ggg agg ctt Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu 130	135	140	431
gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg gag agg ccc Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro 145	150	155	479
ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg cgc ctg gac Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp 160	165	170	527
gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag gag atc gcc Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala 180	185	190	575
cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc ttc aac ctc Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu 195	200	205	623
aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag cta ggg ctt Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu 210	215	220	671
ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc acc agc gcc Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala 225	230	235	719
gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg gag aag atc Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile 240	245	250	767
ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac att gac ccc Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro 260	265	270	815
ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac acc cgc ttc Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe 275	280	285	863
aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc gat ccc aac Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn 290	295	300	911
ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg atc cgc cgg			959

Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg		
305	310	315
gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg gac tat agc		1007
Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser		
320	325	330
335		
cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac gag aac ctg		1055
Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu		
340	345	350
atc cgg gtc ttc cag gag ggg cggtt gac atc cac acg gag acc gcc agc		1103
Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser		
355	360	365
tgg atg ttc ggc gtc ccc cggtt gag gcc gtg gac ccc ctg atg cgc cggtt		1151
Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg		
370	375	380
gctt ggc aag acc atc aac ttc ggg gtc ctc tac ggc atg tcg gcc cac		1199
Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His		
385	390	395
cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc cag gcc ttc		1247
Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe		
400	405	410
415		
att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc tgg att gag		1295
Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu		
420	425	430
aag acc ctc gag gag ggc agg agg cgg ggg tac gtg gag acc ctc ttc		1343
Lys Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe		
435	440	445
ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg aag agc gtg		1391
Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val		
450	455	460
cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc cag ggc acc		1439
Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr		
465	470	475
gcc gcc gac ctc gtg aag ctg gct atg gtg aag ctc ttc ccc agg ctg		1487
Ala Ala Asp Leu Val Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu		
480	485	490
495		
gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac gag ctg gtc		1535
Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val		
500	505	510

ctc gag gcc cca aaa gag ggg gcg gag	gcc gtg gcc cgg ctg gcc aag	1583
Leu Glu Ala Pro Lys Glu Gly Ala Glu	Ala Val Ala Arg Leu Ala Lys	
515	520	525
gag gtc atg gag ggg gtg tat ccc ctg	gcc gtg ccc ctg gag gtg gag	1631
Glu Val Met Glu Gly Val Tyr Pro Leu	Ala Val Pro Leu Glu Val Glu	
530	535	540
gtg ggg ata ggg gag gac tgg ctc tcc	gcc aag gag gcg gcc gca ctg	1679
Val Gly Ile Gly Glu Asp Trp Leu Ser	Ala Lys Glu Ala Ala Ala Leu	
545	550	555
gtg ccg cgc		1688
Val Pro Arg		
560		

<210> 38
<211> 562
<212> PRT
<213> Thermus aquaticus

<400> 38

Met Ala Ser Gly Gly Gly Cys Gly	Gly Gly Gly Ser Pro Lys Ala		
1	5	10	15

Leu Glu Glu Ala Pro Trp Pro Pro	Glu Gly Ala Phe Val Gly Phe	
20	25	30

Val Leu Ser Arg Lys Glu Pro Met Trp	Ala Asp Leu Leu Ala Leu Ala	
35	40	45

Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu Pro Tyr Lys Ala		
50	55	60

Leu Arg Asp Leu Lys Glu Ala Arg Gly	Leu Leu Ala Lys Asp Leu Ser		
65	70	75	80

Val Leu Ala Leu Arg Glu Gly Leu Gly	Leu Pro Pro Gly Asp Asp Pro	
85	90	95

Met Leu Leu Ala Tyr Leu Leu Asp Pro	Ser Asn Thr Thr Pro Glu Gly	
100	105	110

Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu Ala Gly Glu Arg
115 120 125

Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp Gly Arg Leu Glu
130 135 140

Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val Glu Arg Pro Leu
145 150 155 160

Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val Arg Leu Asp Val
165 170 175

Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu Glu Ile Ala Arg
180 185 190

Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro Phe Asn Leu Asn
195 200 205

Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu Leu Gly Leu Pro
210 215 220

Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser Thr Ser Ala Ala
225 230 235 240

Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val Glu Lys Ile Leu
245 250 255

Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr Ile Asp Pro Leu
260 265 270

Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His Thr Arg Phe Asn
275 280 285

Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn Leu
290 295 300

Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg Ile Arg Arg Ala
305 310 315 320

Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu Asp Tyr Ser Gln
325 330 335

Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp Glu Asn Leu Ile
340 345 350

Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu Thr Ala Ser Trp
355 360 365

Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu Met Arg Arg Ala
370 375 380

Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met Ser Ala His Arg
385 390 395 400

Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala Gln Ala Phe Ile
405 410 415

Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala Trp Ile Glu Lys
420 425 430

Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu Thr Leu Phe Gly
435 440 445

Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val Lys Ser Val Arg
450 455 460

Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val Gln Gly Thr Ala
465 470 475 480

Ala Asp Leu Val Lys Leu Ala Met Val Lys Leu Phe Pro Arg Leu Glu
485 490 495

Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp Glu Leu Val Leu
500 505 510

Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg Leu Ala Lys Glu

515 520 525

Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu Glu Val Glu Val
530 535 540

Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala Ala Ala Leu Val
545 550 555 560

Pro Arg

<210> 39
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 39

Met Ala Ser Gly Gly Gly Gly Cys Gly Gly Gly Gly
1 5 10

<210> 40
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 40

Ala Ala Ala Leu Val Pro Arg Gly Ser Leu Glu His His His His His
1 5 10 15

His

<210> 41
<211> 22
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 41

Met Lys Tyr Leu Leu Pro Thr Ala Ala Ala Gly Leu Leu Leu Leu Ala
1 5 10 15

Ala Gln Pro Ala Met Ala
20

<210> 42

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 42

Met Lys Thr Leu Leu Ala Met Val Leu Val Gly Leu Leu Leu Leu Pro
1 5 10 15

Pro Gly Pro Ser Met Ala
20

<210> 43

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic Peptide

<400> 43

Met Arg Gly Leu Leu Ala Met Leu Val Ala Gly Leu Leu Leu Leu Pro
1 5 10 15

Ile Ala Pro Ala Met Ala
20

<210> 44

<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 44

Met Arg Arg Leu Leu Val Ile Ala Ala Val Gly Leu Leu Leu Leu Leu
1 5 10 15

Ala Pro Pro Thr Met Ala
20

<210> 45
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic DNA

<400> 45

gcggccgcac tggtgccgca cggcagcctc gag

33

<210> 46
<211> 148
<212> PRT
<213> Homo sapiens

<400> 46

Ala Asp Gln Leu Thr Glu Glu Gln Ile Ala Glu Phe Lys Glu Ala Phe
1 5 10 15

Ser Leu Phe Asp Lys Asp Gly Asp Gly Thr Ile Thr Thr Lys Glu Leu
20 25 30

Gly Thr Val Met Arg Ser Leu Gly Gln Asn Pro Thr Glu Ala Glu Leu
35 40 45

Gln Asp Met Ile Asn Glu Val Asp Ala Asp Gly Asn Gly Thr Ile Asp
50 55 60

Phe Pro Glu Phe Leu Thr Met Met Ala Arg Lys Met Lys Asp Thr Asp
 65 70 75 80

Ser Glu Glu Glu Ile Arg Glu Ala Phe Arg Val Phe Asp Lys Asp Gly
 85 90 95

Asn Gly Tyr Ile Ser Ala Ala Glu Leu Arg His Val Met Thr Asn Leu
 100 105 110

Gly Glu Lys Leu Thr Asp Glu Glu Val Asp Glu Met Ile Arg Glu Ala
 115 120 125

Asp Ile Asp Gly Asp Gly Gln Val Asn Tyr Glu Glu Phe Val Gln Met
 130 135 140

Met Thr Ala Lys
 145

<210> 47
<211> 114
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic DNA

<400> 47

Gln Val Gln Leu Gln Gln Ser Gly Pro Glu Asp Val Lys Pro Gly Ala
 1 5 10 15

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp Tyr
 20 25 30

Tyr Met Asn Trp Val Lys Gln Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Asp Ile Asn Pro Asn Asn Gly Gly Thr Ser Tyr Asn Gln Lys Phe
 50 55 60

Lys Gly Arg Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

Met Glu Leu Arg Ser Leu Thr Ser Glu Asp Ser Ser Val Tyr Tyr Cys
85 90 95

Glu Ser Gln Ser Gly Ala Tyr Trp Gly Gln Gly Thr Thr Val Thr Val
100 105 110

Ser Ala

<210> 48
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 48

Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser Gly
1 5 10 15

Gly Gly Gly Ser
20

<210> 49
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 49

Asp Tyr Lys Asp Ile Leu Met Thr Gln Thr Pro Ser Ser Leu Pro Val
1 5 10 15

Ser Leu Gly Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile
20 25 30

Val His Ser Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro
35 40 45

Gly Gln Ser Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser
50 55 60

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
65 70 75 80

Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys
85 90 95

Phe Gln Gly Ser His Val Pro Phe Thr Phe Gly Ser Gly Thr Lys Leu
100 105 110

Glu Ile Lys Arg
115

<210> 50
<211> 291
<212> PRT
<213> Thermus thermophilus

<400> 50

Met Glu Ala Met Leu Pro Leu Phe Glu Pro Lys Gly Arg Val Leu Leu
1 5 10 15

Val Asp Gly His His Leu Ala Tyr Arg Thr Phe Phe Ala Leu Lys Gly
20 25 30

Leu Thr Thr Ser Arg Gly Glu Pro Val Gln Ala Val Tyr Gly Phe Ala
35 40 45

Lys Ser Leu Leu Lys Ala Leu Lys Glu Asp Gly Tyr Lys Ala Val Phe
50 55 60

Val Val Phe Asp Ala Lys Ala Pro Ser Phe Arg His Glu Ala Tyr Glu
65 70 75 80

Ala Tyr Lys Ala Gly Arg Ala Pro Thr Pro Glu Asp Phe Pro Arg Gln
85 90 95

Leu Ala Leu Ile Lys Glu Leu Val Asp Leu Leu Gly Phe Thr Arg Leu
100 105 110

Glu Val Pro Gly Tyr Glu Ala Asp Asp Val Leu Ala Thr Leu Ala Lys
115 120 125

Lys Ala Glu Lys Glu Gly Tyr Glu Val Arg Ile Leu Thr Ala Asp Arg
130 135 140

Asp Leu Tyr Gln Leu Val Ser Asp Arg Val Ala Val Leu His Pro Glu
145 150 155 160

Gly His Leu Ile Thr Pro Glu Trp Leu Trp Glu Lys Tyr Gly Leu Arg
165 170 175

Pro Glu Gln Trp Val Asp Phe Arg Ala Leu Val Gly Asp Pro Ser Asp
180 185 190

Asn Leu Pro Gly Val Lys Gly Ile Gly Glu Lys Thr Ala Leu Lys Leu
195 200 205

Leu Lys Glu Trp Gly Ser Leu Glu Asn Leu Leu Lys Asn Leu Asp Arg
210 215 220

Val Lys Pro Glu Asn Val Arg Glu Lys Ile Lys Ala His Leu Glu Asp
225 230 235 240

Leu Arg Leu Ser Leu Glu Leu Ser Arg Val Arg Thr Asp Leu Pro Leu
245 250 255

Glu Val Asp Leu Ala Gln Gly Arg Glu Pro Asp Arg Glu Gly Leu Arg
260 265 270

Ala Phe Leu Glu Arg Leu Glu Phe Gly Ser Leu Leu His Glu Phe Gly
275 280 285

Leu Leu Glu
290

<210> 51
<211> 196
<212> PRT
<213> Escherichia coli

<400> 51

Val Ile Ser Tyr Asp Asn Tyr Val Thr Ile Leu Asp Glu Glu Thr Leu
1 5 10 15

Lys Ala Trp Ile Ala Lys Leu Glu Lys Ala Pro Val Phe Ala Phe Asp
20 25 30

Thr Glu Thr Asp Ser Leu Asp Asn Ile Ser Ala Asn Leu Val Gly Leu
35 40 45

Ser Phe Ala Ile Glu Pro Gly Val Ala Ala Tyr Ile Pro Val Ala His
50 55 60

Asp Tyr Leu Asp Ala Pro Asp Gln Ile Ser Arg Glu Arg Ala Leu Glu
65 70 75 80

Leu Leu Lys Pro Leu Leu Glu Asp Glu Lys Ala Leu Lys Val Gly Gln
85 90 95

Asn Leu Lys Tyr Asp Arg Gly Ile Leu Ala Asn Tyr Gly Ile Glu Leu
100 105 110

Arg Gly Ile Ala Phe Asp Thr Met Leu Glu Ser Tyr Ile Leu Asn Ser
115 120 125

Val Ala Gly Arg His Asp Met Asp Ser Leu Ala Glu Arg Trp Leu Lys
130 135 140

His Lys Thr Ile Thr Phe Glu Glu Ile Ala Gly Lys Gly Lys Asn Gln
145 150 155 160

Leu Thr Phe Asn Gln Ile Ala Leu Glu Glu Ala Gly Arg Tyr Ala Ala
165 170 175

Glu Asp Ala Asp Val Thr Leu Gln Leu His Leu Lys Met Trp Pro Asp
180 185 190

Leu Gln Lys His
195

<210> 52
<211> 686
<212> PRT
<213> Bacillus circulans

<400> 52

Ala Pro Asp Thr Ser Val Ser Asn Lys Gln Asn Phe Ser Thr Asp Val
1 5 10 15

Ile Tyr Gln Ile Phe Thr Asp Arg Phe Ser Asp Gly Asn Pro Ala Asn
20 25 30.

Asn Pro Thr Gly Ala Ala Phe Asp Gly Thr Cys Thr Asn Leu Arg Leu
35 40 45

Tyr Cys Gly Gly Asp Trp Gln Gly Ile Ile Asn Lys Ile Asn Asp Gly
50 55 60

Tyr Leu Thr Gly Met Gly Val Thr Ala Ile Trp Ile Ser Gln Pro Val
65 70 75 80

Glu Asn Ile Tyr Ser Ile Ile Asn Tyr Ser Gly Val Asn Asn Thr Ala
85 90 95

Tyr His Gly Tyr Trp Ala Arg Asp Phe Lys Lys Thr Asn Pro Ala Tyr
100 105 110

Gly Thr Ile Ala Asp Phe Gln Asn Leu Ile Ala Ala Ala His Ala Lys
115 120 125

Asn Ile Lys Val Ile Ile Asp Phe Ala Pro Asn His Thr Ser Pro Ala
130 . 135 140

Ser Ser Asp Gln Pro Ser Phe Ala Glu Asn Gly Arg Leu Tyr Asp Asn
145 150 155 160

Gly Thr Leu Leu Gly Gly Tyr Thr Asn Asp Thr Gln Asn Leu Phe His
165 170 175

His Asn Gly Gly Thr Asp Phe Ser Thr Thr Glu Asn Gly Ile Tyr Lys
180 185 190

Asn Leu Tyr Asp Leu Ala Asp Leu Asn His Asn Asn Ser Thr Val Asp
195 200 205

Val Tyr Leu Lys Asp Ala Ile Lys Met Trp Leu Asp Leu Gly Ile Asp
210 215 220

Gly Ile Arg Met Asp Ala Val Lys His Met Pro Phe Gly Trp Gln Lys
225 230 235 240

Ser Phe Met Ala Ala Val Asn Asn Tyr Lys Pro Val Phe Thr Phe Gly
245 250 255

Glu Trp Phe Leu Gly Val Asn Glu Val Ser Pro Glu Asn His Lys Phe
260 265 270

Ala Asn Glu Ser Gly Met Ser Leu Leu Asp Phe Arg Phe Ala Gln Lys
275 280 285

Val Arg Gln Val Phe Arg Asp Asn Thr Asp Asn Met Tyr Gly Leu Lys
290 295 300

Ala Met Leu Glu Gly Ser Ala Ala Asp Tyr Ala Gln Val Asp Asp Gln
305 310 315 320

Val Thr Phe Ile Asp Asn His Asp Met Glu Arg Phe His Ala Ser Asn

325

330

335

Ala Asn Arg Arg Lys Leu Glu Gln Ala Leu Ala Phe Thr Leu Thr Ser
340 345 350

Arg Gly Val Pro Ala Ile Tyr Tyr Gly Thr Glu Gln Tyr Met Ser Gly
355 360 365

Gly Thr Asp Pro Asp Asn Arg Ala Arg Ile Pro Ser Phe Ser Thr Ser
370 375 380

Thr Thr Ala Tyr Gln Val Ile Gln Lys Leu Ala Pro Leu Arg Lys Cys
385 390 395 400

Asn Pro Ala Ile Ala Tyr Gly Ser Thr Gln Glu Arg Trp Ile Asn Asn
405 410 415

Asp Val Leu Ile Tyr Glu Arg Lys Phe Gly Ser Asn Val Ala Val Val
420 425 430

Ala Val Asn Arg Asn Leu Asn Ala Pro Ala Ser Ile Ser Gly Leu Val
435 440 445

Thr Ser Leu Pro Gln Gly Ser Tyr Asn Asp Val Leu Gly Gly Leu Leu
450 455 460

Asn Gly Asn Thr Leu Ser Val Gly Ser Gly Gly Ala Ala Ser Asn Phe
465 470 475 480

Thr Leu Ala Ala Gly Gly Thr Ala Val Trp Gln Tyr Thr Ala Ala Thr
485 490 495

Ala Thr Pro Thr Ile Gly His Val Gly Pro Met Met Ala Lys Pro Gly
500 505 510

Val Thr Ile Thr Ile Asp Gly Arg Gly Phe Gly Ser Ser Lys Gly Thr
515 520 525

Val Tyr Phe Gly Thr Thr Ala Val Ser Gly Ala Asp Ile Thr Ser Trp
 530 535 540

Glu Asp Thr Gln Ile Lys Val Lys Ile Pro Ala Val Ala Gly Gly Asn
 545 550 555 560

Tyr Asn Ile Lys Val Ala Asn Ala Ala Gly Thr Ala Ser Asn Val Tyr
 565 570 575

Asp Asn Phe Glu Val Leu Ser Gly Asp Gln Val Ser Val Arg Phe Val
 580 585 590

Val Asn Asn Ala Thr Thr Ala Leu Gly Gln Asn Val Tyr Leu Thr Gly
 595 600 605

Ser Val Ser Glu Leu Gly Asn Trp Asp Pro Ala Lys Ala Ile Gly Pro
 610 615 620

Met Tyr Asn Gln Val Val Tyr Gln Tyr Pro Asn Trp Tyr Tyr Asp Val
 625 630 635 640

Ser Val Pro Ala Gly Lys Thr Ile Glu Phe Lys Phe Leu Lys Lys Gln
 645 650 655

Gly Ser Thr Val Thr Trp Glu Gly Gly Ser Asn His Thr Phe Thr Ala
 660 665 670

Pro Ser Ser Gly Thr Ala Thr Ile Asn Val Asn Trp Gln Pro
 675 680 685

<210> 53

<211> 399

<212> PRT

<213> *Bordetella pertussis*

<400> 53

Met Gln Gln Ser His Gln Ala Gly Tyr Ala Asn Ala Ala Asp Arg Glu
 1 5 10 15

Ser Gly Ile Pro Ala Ala Val Leu Asp Gly Ile Lys Ala Val Ala Lys
20 25 30

Glu Lys Asn Ala Thr Leu Met Phe Arg Leu Val Asn Pro His Ser Thr
35 40 45

Ser Leu Ile Ala Glu Gly Val Ala Thr Lys Gly Leu Gly Val His Ala
50 55 60

Lys Ser Ser Asp Trp Gly Leu Gln Ala Gly Tyr Ile Pro Val Asn Pro
65 70 75 80

Asn Leu Ser Lys Leu Phe Gly Arg Ala Pro Glu Val Ile Ala Arg Ala
85 90 95

Asp Asn Asp Val Asn Ser Ser Leu Ala His Gly His Thr Ala Val Asp
100 105 110

Leu Thr Leu Ser Lys Glu Arg Leu Asp Tyr Leu Arg Gln Ala Gly Leu
115 120 125

Val Thr Gly Met Ala Asp Gly Val Val Ala Ser Asn His Ala Gly Tyr
130 135 140

Glu Gln Phe Glu Phe Arg Val Lys Glu Thr Ser Asp Gly Arg Tyr Ala
145 150 155 160

Val Gln Tyr Arg Arg Lys Gly Gly Asp Asp Phe Glu Ala Val Lys Val
165 170 175

Ile Gly Asn Ala Ala Gly Ile Pro Leu Thr Ala Asp Ile Asp Met Phe
180 185 190

Ala Ile Met Pro His Leu Ser Asn Phe Arg Asp Ser Ala Arg Ser Ser
195 200 205

Val Thr Ser Gly Asp Ser Val Thr Asp Tyr Leu Ala Arg Thr Arg Arg
210 215 220

Ala Ala Ser Glu Ala Thr Gly Gly Leu Asp Arg Glu Arg Ile Asp Leu
225 230 235 240

Leu Trp Lys Ile Ala Arg Ala Gly Ala Arg Ser Ala Val Gly Thr Glu
245 250 255

Ala Arg Arg Gln Phe Arg Tyr Asp Gly Asp Met Asn Ile Gly Val Ile
260 265 270

Thr Asp Phe Glu Leu Glu Val Arg Asn Ala Leu Asn Arg Arg Ala His
275 280 285

Ala Val Gly Ala Gln Asp Val Val Gln His Gly Thr Glu Gln Asn Asn
290 295 300

Pro Phe Pro Glu Ala Asp Glu Lys Ile Phe Val Val Ser Ala Thr Gly
305 310 315 320

Glu Ser Gln Met Leu Thr Arg Gly Gln Leu Lys Glu Tyr Ile Gly Gln
325 330 335

Gln Arg Gly Glu Gly Tyr Val Phe Tyr Glu Asn Arg Ala Tyr Gly Val
340 345 350

Ala Gly Lys Ser Leu Phe Asp Asp Gly Leu Gly Ala Ala Pro Gly Val
355 360 365

Pro Ser Gly Arg Ser Lys Phe Ser Pro Asp Val Leu Glu Thr Val Pro
370 375 380

Ala Ser Pro Gly Leu Arg Arg Pro Ser Leu Gly Ala Val Glu Arg
385 390 395

<210> 54
<211> 275
<212> PRT
<213> *Bacillus amyloliquefaciens*

<400> 54

Ala Gln Ser Val Pro Tyr Gly Val Ser Gln Ile Lys Ala Pro Ala Leu
1 5 10 15

His Ser Gln Gly Tyr Thr Gly Ser Asn Val Lys Val Ala Val Ile Asp
20 25 30

Ser Gly Ile Asp Ser Ser His Pro Asp Leu Lys Val Ala Gly Gly Ala
35 40 45

Ser Met Val Pro Ser Glu Thr Asn Pro Phe Gln Asp Asn Asn Ser His
50 55 60

Gly Thr His Val Ala Gly Thr Val Ala Ala Leu Asn Asn Ser Ile Gly
65 70 75 80

Val Leu Gly Val Ala Pro Ser Ala Ser Leu Tyr Ala Val Lys Val Leu
85 90 95

Gly Ala Asp Gly Ser Gly Gln Tyr Ser Trp Ile Ile Asn Gly Ile Glu
100 105 110

Trp Ala Ile Ala Asn Asn Met Asp Val Ile Asn Met Ser Leu Gly Gly
115 120 125

Pro Ser Gly Ser Ala Ala Leu Lys Ala Ala Val Asp Lys Ala Val Ala
130 135 140

Ser Gly Val Val Val Val Ala Ala Ala Gly Asn Glu Gly Thr Ser Gly
145 150 155 160

Ser Ser Ser Thr Val Gly Tyr Pro Gly Lys Tyr Pro Ser Val Ile Ala
165 170 175

Val Gly Ala Val Asp Ser Ser Asn Gln Arg Ala Ser Phe Ser Ser Val
180 185 190

Gly Pro Glu Leu Asp Val Met Ala Pro Gly Val Ser Ile Gln Ser Thr
195 200 205

Leu Pro Gly Asn Lys Tyr Gly Ala Tyr Asn Gly Thr Ser Met Ala Ser
210 215 220

Pro His Val Ala Gly Ala Ala Ala Leu Ile Leu Ser Lys His Pro Asn
225 230 235 240

Trp Thr Asn Thr Gln Val Arg Ser Ser Leu Glu Asn Thr Thr Thr Lys
245 250 255

Leu Gly Asp Ser Phe Tyr Tyr Gly Lys Gly Leu Ile Asn Val Gln Ala
260 265 270

Ala Ala Gln
275

<210> 55
<211> 182
<212> PRT
<213> Bacillus subtilis

<400> 55

Ala Ala Glu His Asn Pro Val Val Met Val His Gly Ile Gly Gly Ala
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Ser Phe Asn Phe Ala Gly Ile Lys Ser Tyr Leu Val Ser Gln Gly Trp
20 25 30

Ser Arg Asp Lys Leu Tyr Ala Val Asp Phe Trp Asp Lys Thr Gly Thr
35 40 45

Asn Tyr Asn Asn Gly Pro Val Leu Ser Arg Phe Val Gln Lys Val Leu
50 55 60

Asp Glu Thr Gly Ala Lys Lys Val Asp Ile Val Ala His Ser Met Gly
65 70 75 80

Gly Ala Asn Thr Leu Tyr Tyr Ile Lys Asn Leu Asp Gly Gly Asn Lys
85 90 95

Val Ala Asn Val Val Thr Leu Gly Gly Ala Asn Arg Leu Thr Thr Gly
 100 105 110

Lys Ala Leu Pro Gly Thr Asp Pro Asn Gln Lys Ile Leu Tyr Thr Ser
 115 120 125

Ile Tyr Ser Ser Ala Asp Met Ile Val Met Asn Tyr Leu Ser Arg Leu
 130 135 140

Asp Gly Ala Arg Asn Val Gln Ile His Gly Val Gly His Ile Gly Leu
 145 150 155 160

Leu Tyr Ser Ser Gln Val Asn Ser Leu Ile Lys Glu Gly Leu Asn Gly
 165 170 175

Gly Gly Gln Asn Thr Asn
 180

<210> 56

<211> 444

<212> DNA

<213> Homo sapiens

<400> 56

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cagaatccca cagaaggcaga gttacaggac atgattaatg aagtagatgc tcatggtaat 180

ggcacaaattt acttccctga atttctgaca atgatggcaa gaaaaatgaa agacacagac 240

agtgaagaag aaatttagaga agcattccgt gtgtttgata aggatggcaa tggctatatt 300

agtgcgtcag aacttcgcca tgtgatgaca aaccttggag agaagttaac agatgaagaa 360

gttcatgaaa tgatcagggaa agcagatatt gatggtgatg gtcaagtaaa ctatgaagag 420

tttgtacaaa tgatgacagc aaag 444

<210> 57

<211> 2058

<212> DNA

<213> Bacillus circulans

<400> 57

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ggaacctgca	cgaacctccg	gctgtattgc	ggcggcgact	ggcagggcat	catcaacaaa	180
atcaacgacg	gttacctgac	cgggatggc	gttaccgcca	tctggatctc	ccagccggc	240
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aaccataaca	acagcacccgt	ggacgtctac	ttgaaggacg	cgataaaaat	gtggctggac	660
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agctttatgg	ctgcccgtcaa	caactataag	ccggctttta	cttcggcga	atggttcctg	780
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ggcaaaatg	tgtacctgac	ggcagtgtc	agcgagctgg	ggaactggga	ccggcaaaa	1860
gcaatcgggc	cgtgtacaa	tcaaggtcgtt	taccaatatc	cgaactggta	ttatgacgtc	1920
acgtttccgg	ccggcaaaac	gatcgagttc	aagttttga	aaaaacaagg	ctccaccgtc	1980
acgtggaaag	gcggcagcaa	ccacaccttc	accgcgtccgt	ccagcggcac	cgcgaccatt	2040
aacgtgaatt	ggcagcca					2058

<210> 58
 <211> 1197
 <212> DNA
 <213> *Bordetella pertussis*

<400> 58						
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cgccctggta	accccccattc	caccagcctg	attgccgaag	gggtggccac	caaaggattg	180
ggcgtgcacg	ccaagtcgtc	cgattggggg	ttgcaggcgg	gctacattcc	cgtcaacccg	240
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cacgcaggct	acgagcagtt	cgagtttcgc	gtgaaggaaa	cctcggacgg	gcgcgtatgcc	480
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gccggatttc	cactgacggc	ggatatcgac	atgttcgcca	ttatgccc	tctgtccaac	600
ttccgcgact	cggcgcgac	ttcggtgacc	agcggcgatt	cggtgaccga	ttacactggcg	660

cgcacgcggc gggccgcccag cgaggccacg ggccggctgg atcgcaacg catcgacttg 720
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 ttccgctacg acggcgacat gaatatcggc gtgatcaccg atttcgagct ggaagtgcgc 840
 aatgcgctga acaggcgggc gcacgcccgtc ggcgcgcagg acgtggtcca gcatggcact 900
 gagcagaaca atcctttccc ggaggcagat gagaagattt tcgtcgtatc ggccaccgg 960
 gaaagccaga tgctcacgca cggcaactg aaggaataca ttggccagca gcgcggcgag 1020
 ggctatgtct tctacgagaa ccgtgcatac ggcgtggcgg ggaaaagcct gttcgacgat 1080
 gggctgggag ccgcgccccgg cgtgccgagc ggacgttcga agttctcgcc ggatgtactg 1140
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<210> 59
 <211> 825
 <212> DNA
 <213> *Bacillus amyloliquefaciens*

<400> 59
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 gatttaaagg tagcaggcgg agccagcatg gttccttctg aaacaaatcc tttccaagac 180
 aacaactctc acggaactca cgttgccggc acagttgcgg ctcttaataa ctcaatcggt 240
 gtattaggcg ttgcgccaag cgcacactt tacgctgtaa aagttctcg 300
 tccggccaat acagctggat cattaacgga atcgagtg 360
 gttattaaaca tgagcctcgg cggaccttctt ggttctgctg cttaaaaagc ggcagttgat 420
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 cctggcgtat ctatccaaag cacgcttcctt ggaaacaaat acggggcgta caacggtacg 660
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ttctactatg gaaaaggcgt gatcaacgta caggcgccag ctcag 825

<210> 60

<211> 873

<212> DNA

<213> Thermus thermophilus

<400> 60

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cacctggcct accgcaccc ttccgcctg aagggcctca ccacgagccg gggcgaaccg 120

gtgcaggcgg tctacggctt cgccaagagc ctctcaagg ccctgaagga ggacgggtac 180

aaggccgtct tcgtggtctt tgacgccaag gccccctcct tccgccacga ggcctacgag 240

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aaggagctgg tggacctcct ggggtttacc cgccctcgagg tccccggcta cgaggcggac 360

gacgttctcg ccaccctggc caagaaggcg gaaaaggagg ggtacgaggt gcgcattcctc 420

accggccgacc gcgacctcta ccaactcgtc tccgaccgcg tcgcccgtcct ccaccccgag 480

ggccacactca tcaccccgga. gtggctttgg gagaagtacg gcctcaggcc ggagcagtgg 540

gtggacttcc gcgcctcggt gggggacccccc tccgacaacc tccccggggt caagggcatc 600

ggggagaaga ccgcctcaa gctcctcaag gagtgaaaaa gcctggaaaaa cctcctcaag 660

aacctggacc gggtaaagcc agaaaacgac cgggagaaga tcaaggccca cctggaaagac 720

ctcaggctct cttggagct ctccccgggtg cgccaccgacc tccccctggg ggtggacctc 780

gcccaggggc gggagcccgaa ccgggagggg ctttagggcct tcctggagag gctggagttc 840

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<210> 61

<211> 588

<212> DNA

<213> Escherichia coli

<400> 61

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atctctgcta acctggtcgg gctttctttt gctatcgagc caggcgttagc ggcatatatt 180
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ttgctaaaac cgctgctgga agatgaaaag gcgcgtgaagg tcgggcaaaa cctgaaatac 300
gatcgccgta ttctggcgaa ctacggcatt gaactgcgtg ggattgcgtt tgataaccatg 360
ctggagtcct acattctcaa tagcggttgcc gggcgtcacg atatggacag cctcgccgaa 420
cgttgggtga agcacaaaaac catcactttt gaagagattg ctggtaaagg caaaaatcaa 480
ctgacacctta accagattgc cctcgaagaa gccggacgtt acgcccggcga agatgcagat 540
qtcacacctqc aqttqcatct qaaaatgtqq ccqqatctqc aaaaacac 588

<210> 62
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221>. CDS
<222> (1) .. (1635)

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gat tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335			1008
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acc gcc agc tgg atg ttc ggc gtc ccc cg ^g gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365			1104
atg cgc cg ^g gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380			1152
tcg gcc cac cg ^c ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400			1200
cag gcc ttc ata gag cg ^c tgc ttt .cag agc ttc ccc aag gtg cg ^g gcc Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415			1248
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aag agc gtg cg ^g gag gc ^g gca gag cg ^c atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val 450 455 460			1392
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465 470 475 480			1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485 490 495			1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cg ^g			1536

Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg	
500							505							510		
ctg	gtc	aag	gag	gtc	atg	gag	ggg	gtg	tat	ccc	ctg	gcc	gtg	ccc	ctg	1584
Leu	Val	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	Leu	
515							520							525		
gag	gtg	gag	gtg	ggg	ata	ggg	gag	gac	tgg	ctc	tcc	gcc	aag	gag	gcg	1632
Glu	Val	Glu	Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	Ala	
530							535							540		
gcc	gc															1637
Ala																
545																
<210>	63															
<211>	545															
<212>	PRT															
<213>	Thermus aquaticus															
<400>	63															
Ser	Pro	Lys	Ala	Leu	Glu	Glu	Ala	Pro	Trp	Pro	Pro	Pro	Glu	Gly	Ala	
1				5					10					15		
Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu	
			20					25						30		
Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu	
						35		40						45		
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala	
			50			55								60		
Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro	
						65		70			75			80		
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr	
							85		90					95		
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu	
				100				105						110		

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Gly Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Val Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 64
 <211> 1637
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (1)..(1635)

<400> 64

agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc	48
Ser Pro Lys Ala Leu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala	
1 5 10 15	

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt	96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	

ctg gcc ctg gcc gcc agg ggg ggc cggt gtc cac cggt gcc ccc gag	144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	

cct tat aaa gcc ctc agg gac ctg aag gag gcg cggt ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	

acc ccc gag ggg gtg gcc cggt cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
100 105 110	

gcg ggg gag cggt gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	

115	120	125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val 130 135 140			432
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val 145 150 155 160			480
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu 165 170 175			528
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cgc ccc Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly Arg Pro 180 185 190			576
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu 195 200 205			624
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser 210 215 220			672
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225 230 235 240			720
gag aag atc Ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245 250 255			768
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His 260 265 270			816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285			864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300			912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu 305 310 315 320			960
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac			1008

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp				
325	330	335		
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag				1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu				
340	345	350		
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg				1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu				
355	360	365		
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg				1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met				
370	375	380		
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc				1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala				
385	390	395	400	
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc				1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala				
405	410	415		
tgg att gag aag acc ctg gag ggc agg agg cgg ggg tac gtg gag				1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu				
420	425	430		
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg				1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val				
435	440	445		
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc				1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val				
450	455	460		
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc				1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe				
465	470	475	480	
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac				1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp				
485	490	495		
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg				1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg				
500	505	510		
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg				1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu				
515	520	525		

gag gtg gag gtg ggg ata gag gac cgg ctc tcc gcc aag gag gcg 1632
 Glu Val Glu Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala
 530 535 540

gcc gc . 1637
 Ala
 545

<210> 65
 <211> 545
 <212> PRT
 <213> Thermus aquaticus

<400> 65

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly Arg Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 . 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val,
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Arg Leu Ser Ala Lys Glu Ala
530 535 540

Ala

545

<210> 66
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (1)..(1635)

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val				
145	150	155	160	
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag				528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu				
165	170	175		
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc				576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro				
180	185	190		
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag				624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu				
195	200	205		
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc				672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser				
210	215	220		
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg				720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val				
225	230	235	240	
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag acg acc tac				768
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr				
245	250	255		
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac				816
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His				
260	265	270		
acc cgc ttc aac cag acg gcc acg ggc agg cta agt acg tcc				864
Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser				
275	280	285		
gat ccc aac ctc cag aac atc ccc atc cgc acc ccg ctt ggg cag agg				912
Asp Pro Asn Leu Gln Asn Ile Pro Ile Arg Thr Pro Leu Gly Gln Arg				
290	295	300		
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg				960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu				
305	310	315	320	
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac				1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp				
325	330	335		
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac ttc cac acg gag				1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Phe His Thr Glu				
340	345	350		

acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg		1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu		
355	360	365
atg cgcccg ggccgg aaccatc aactttccgggtccctctatccggatgg		1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met		
370	375	380
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc		1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala		
385	390	395
cag gcc ttc att gag cgcc tac ttt cag agc ttc ccc aag gtg cgccgg		1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala		
405	410	415
tgg att gag aag acc ctg gag gag ggc agg agg cggttacgttgag		1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu		
420	425	430
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cggttgc		1344
Thr Leu Phe Gly Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val		
435	440	445
aag agc gtg cggttgc aag gccc ttcatgc aacatggccatgc		1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val		
450	455	460
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttcc		1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe		
465	470	475
480		
ccc agg ctg gag gaa atg gag gcc agg atg ctc ctt cag gtc cac gac		1488
Pro Arg Leu Glu Glu Met Glu Ala Arg Met Leu Leu Gln Val His Asp		
485	490	495
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gca gtg gcc cggtt		1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg		
500	505	510
ctg gcc aag gag gtc atg gag ggg gtgttatcccctgtgtcccccctg		1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu		
515	520	525
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg		1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala		
530	535	540
gcc gc		1637
Ala		
545		

<210> 67
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 67

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Ile Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Phe His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met

370

375

380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Glu Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 68
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>

<221> CDS

<222> (1)..(1635)

<400> 68

agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg ggc	48
Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala	
1 5 10 15	
 ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt	96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	
 ctg gcc ctg gcc gcc agg ggg ggc cg ^g gtc cac cg ^g gcc ccc gag	144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	
 cct tat aaa gcc ctc agg gac ctg aag gag gc ^g cg ^g ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	
 aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	
 ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	
 acc ccc gag ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
100 105 110	
 cg ^g ggg gag cg ^g gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	
 ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cg ^g gag gtg	432
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	
 gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	
 cg ^c ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag	528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	
165 170 175	

gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro 180 185 190	576
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu 195 200 205	624
cta ggg ctt ccc gcc atc ggc aag acg gag aag tcc ggc aag cgc tcc Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Ser Gly Lys Arg Ser 210 215 220	672
acc agc gcc gcc gtc ctg gag gcc ct _C cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225 230 235 240	720
gag aag atc ctg cag tac cgg gag ct _C acc aag ctg aag agc acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245 250 255	768
att gac ccc ttg ccg gac cac atc ca _C ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp His Ile His Pro Arg Thr Gly Arg Leu His 260 265 270	816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285	864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300	912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu 305 310 315 320	960
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335	1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340 345 350	1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365	1104
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380	1152

tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc	1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala	
385 390 395 400	
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cggttccgcc	1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala	
405 410 415	
tgg att gag aag acc ctg gag gag ggc agg agg cggttccgttg	1296
Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Arg Gly Tyr Val Glu	
420 425 430	
acc ctc ttc ggc cgc cgc tac gtgttccgttg	1344
Thr Leu Phe Gly Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val	
435 440 445	
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc	1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val	
450 455 460	
cag ggc acc gcc gac ctc atg aag ctgttccgttg	1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe	
465 470 475 480	
ccc agg ctg gag gaa atg ggg gcc agg aag ctc ctt cag gtc cac gac	1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Lys Leu Leu Gln Val His Asp	
485 490 495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtgttccgttg	1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg	
500 505 510	
ctg gcc aag gag gtc atg gag ggg gtgttccgttg	1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu	
515 520 525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg	1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala	
530 535 540	
gcc gc	1637
Ala	
545	

<210> 69
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 69

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu

195

200

205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Ser Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp His Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Lys Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 70
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 70

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Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala	
1 5 10 15	
 ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt	96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	
 ctg gcc ctg gcc gcc agg ggg ggc cg ^g gtc cac cg ^g gcc ccc gag	144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	
 cct tat aaa gcc ctc agg gac ctg aag gag gc ^g cg ^g ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	
 aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc cc ^g ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	
 gc ^g gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	
 acc ccc gag ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg ac ^g gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Glu Trp Thr Glu Glu	
100 105 110	
 gc ^g ggg gag cg ^g gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	
 ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cg ^g gag gtg	432
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	
 gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc ac ^g ggg gtg	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	
 cg ^c ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag	528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	
165 170 175	
 gag atc gcc cg ^c ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc	576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	
180 185 190	
 ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag	624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	
195 200 205	

cta ggg ctt ccc gcc atc ggc aag acg gag aag acc gg< aag cg< tcc	672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser	
210 215 220	
acc agc gcc gcc gtc ctg gag gcc ctc cg< gag gcc ca< ccc atc gtg	720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val	
225 230 235 240	
gag aag atc ctg cg< tac cgg gag ctc acc aag ctg aag agc acc tac	768
Glu Lys Ile Leu Arg Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr	
245 250 255	
att gac ccc ttg ccg gac ctc atc cac ccc agg acg gg< cg< ctc cac	816
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His	
260 265 270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc	864
Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser	
275 280 285	
gat ccc aac ctc cag aac atc ccc gtc cg< acc ccg ct< ggg cag agg	912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg	
290 295 300	
atc cgc cg< gcc ttc atc gcc gag gag ggg tgg cta tt< gtg gcc ctg	960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu	
305 310 315 320	
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac	1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp	
325 330 335	
gag aac ctg atc cg< gtc ttc cag gag ggg cg< gac at< cac acg gag	1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu	
340 345 350	
acc gcc agc tgg atg ttc ggc gtc ccc cg< gag gcc gt< gac ccc ctg	1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu	
355 360 365	
atg cgc cg< gcg gcc aag acc atc aac ttc ggg gtc ct< tac ggc atg	1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met	
370 375 380	
tcg gcc cac cg< ctc tcc cag gag cta gcc atc cct tac gag gag gcc	1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala	
385 390 395 400	
cag gcc ttc att gag cg< tac ttt cag agc ttc ccc aag gtg cg< gcc	1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala	

405	410	415	
tgg att gag aag acc ctg gag gag ggc agg agg cg ^g ggg tac gtg gag			1296
Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Arg Gly Tyr Val Glu			
420	425	430	
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cg ^g gtg			1344
Thr Leu Phe Gly Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			
435	440	445	
aag agc gtg cg ^g gag gc ^g gcc gag cg ^c atg gcc ttc aac atg ccc gtc			1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val			
450	455	460	
cag ggc acc gcc gac ctc atg aag ctg act atg gtg aag ctc ttc			1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Thr Met Val Lys Leu Phe			
465	470	475	480
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac			1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp			
485	490	495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gc ^g gag gcc gtg gcc cg ^g			1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg			
500	505	510	
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg			1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu			
515	520	525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gc ^g			1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala			
530	535	540	
gcc gc			1637
Ala			
545			

<210> 71
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 71

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu

20

25

30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Arg Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Thr Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 72
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 72
 agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc 48
 Ser Pro Lys Ala Leu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

ctg	gcc	ctg	gcc	gcc	agg	ggg	ggc	cgg	gtc	cac	cgg	gcc	ccc	gag		144	
Leu	Ala	Leu	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu			
35					40					45							
cct	tat	aaa	gcc	ctc	agg	gac	ctg	aag	gag	gcg	cgg	ggg	ctt	ctc	gcc		192
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala		
50					55					60							
aaa	gac	ctg	agc	gtt	ctg	gcc	ctg	agg	gaa	ggc	ctt	ggc	ctc	ccg	ccc		240
Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro		
65					70				75				80				
ggc	gac	gac	ccc	atg	ctc	ctc	gcc	tac	ctc	ctg	gac	cct	tcc	aac	acc		288
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr		
85					90					95							
acc	ccc	gag	ggg	gtg	gcc	cgg	cgc	tac	ggc	ggg	gag	tgg	acg	gag	gag		336
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu		
100					105					110							
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg		384
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp		
115					120					125							
ggg	agg	ctt	gag	ggg	gag	gag	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg		432
Gly	Arg	Leu	Glu	Gly	Glu	Gly	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val		
130					135					140							
gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg		480
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val		
145					150				155				160				
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag		528
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu		
165					170					175							
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc		576
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro		
180					185					190							
ctc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag		624
Leu	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu		
195					200					205							
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc		672
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser		
210					215					220							
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg		720
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val		

225	230	235	240
gag aag atc ctg cag tac cg ^g gag ctc acc aag ctg aag agc acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245	250		255
att gac ccc ttg cca gac ctc atc cac ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His 260	265	270	816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275	280	285	864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290	295	300	912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu 305	310	315	960
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325	330	335	1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340	345	350	1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355	360	365	1104
atg cgc cgg gcg gcc aag gcc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Ala Ile Asn Phe Gly Val Leu Tyr Gly Met 370	375	380	1152
tca gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385	390	395	1200
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala 405	410	415	1248
cgg att gag aag acc ctg gag gag ggc agg aga cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420	425	430	1296
acc ctc ttc ggc cgc cgc tat qtq cct qac cta qaq qcc cqg qtq			1344

Thr	Leu	Phe	Gly	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val		
435							440				445					
aag	agc	gtg	cgg	gag	gcf	gcc	gag	cgc	atg	gcc	tac	aac	atg	ccc	gtc	1392
Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Tyr	Asn	Met	Pro	Val	
450							455				460					
cag	ggc	acc	gcc	gcc	gac	ctc	atg	aag	ctg	gct	atg	gtg	aag	ctc	ttc	1440
Gln	Gly	Thr	Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	Phe	
465							470				475				480	
acc	agg	ctg	gag	gaa	acg	ggg	gcc	agg	atg	ctc	ctt	cag	gtc	cac	gac	1488
Thr	Arg	Leu	Glu	Glu	Thr	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His	Asp	
485										490				495		
gag	ctg	gtc	ctc	gag	gcc	cct	aaa	gag	ggg	gcf	gag	gcc	gtg	gcc	cgf	1536
Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg	
500								505					510			
ctg	gcc	aag	gag	gtc	atg	gag	ggg	gtg	tat	ccc	ctg	gcc	gtg	ccc	ctg	1584
Leu	Ala	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	Leu	
515								520					525			
gag	gtg	gag	gtg	ggg	ata	ggg	gag	gac	tgg	ctc	tcc	gcc	aag	gag	gcf	1632
Glu	Val	Glu	Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	Ala	
530							535				540					
gcc	gc															1637
Ala																
545																
<210>	73															
<211>	545															
<212>	PRT															
<213>	Thermus aquaticus															
<400>	73															
Ser	Pro	Lys	Ala	Leu	Glu	Glu	Ala	Pro	Trp	Pro	Pro	Pro	Glu	Gly	Ala	
1				5					10					15		
Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu	
20														30		
Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu	
35														45		

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Leu Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Ala Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Tyr Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Thr Arg Leu Glu Glu Thr Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 74
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 74
 agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc 48
 Ser Pro Lys Ala Leu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

ctg gcc ctg gcc gcc agg ggg ggc cg^g gtc cac cg^g gcc ccc gag 144
 Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

cct tat aaa gcc ctc agg gac ctg aag gag gc^g cg^g ggg ctt ctc gcc 192
 Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala

50	55	60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro 65	70	75	240
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr 85		90	288
acc ccc gag ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg acg gag gag Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu 100	105	110	336
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp 115	120	125	384
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val 130	135	140	432
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val 145	150	155	480
cgc ctg gac gtg gcc tat ctc agg gcc tt ^g tcc ctg gag gtg gcc gag Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu 165	170	175	528
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro 180	185	190	576
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu 195	200	205	624
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser 210	215	220	672
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225	230	235	720
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag acg acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245	250	255	768
att gac ccc ttg ccg gac ccc atc cac ccc agg acg ggc cgc ctc cac			816

Ile Asp Pro Leu Pro Asp Pro Ile His Pro Arg Thr Gly Arg Leu His			
260	265	270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc			864
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser			
275	280	285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg			912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg			
290	295	300	
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg			960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu			
305	310	315	320
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac			1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp			
325	330	335	
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag			1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu			
340	345	350	
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg			1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu			
355	360	365	
atg cgc cgg acg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg			1152
Met Arg Arg Thr Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met			
370	375	380	
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc			1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala			
385	390	395	400
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc			1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala			
405	410	415	
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag			1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu			
420	425	430	
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg			1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			
435	440	445	
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc			1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val			
450	455	460	

cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465	470	475	480	1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485	490	495		1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gtc cg Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Val Arg 500	505	510		1536
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu 515	520	525		1584
gag gtg aag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg Glu Val Lys Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala 530	535	540		1632
gcc gc Ala 545				1637

<210> 75
<211> 545
<212> PRT
<213> *Thermus aquaticus*

<400> 75

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala 1	5	10	15
--	---	----	----

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu 20	25	30
---	----	----

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu 35	40	45
---	----	----

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala 50	55	60
---	----	----

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro 65	70	75	80
---	----	----	----

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Pro Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Thr Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Val Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Lys Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 76
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (1)..(1635)

<400> 76

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agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc
Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1           5           10          15

```

48

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ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
          20           25           30

```

96

ctg gcc ctg gcc gcc agg ggg ggc cgg gtc cac cg_g gcc ccc gag
 Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

144

```

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
      50           55           60

```

192

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aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65          70          75          80

```

240

ggc gac gac ccc atq ctc ctc gcc tac ctc ctc gac cct tcc aac acc

280

Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr
				85					90					95	
acc	ccc	gag	ggg	gtg	gcc	cgg	cgc	tac	ggc	ggg	gag	tgg	acg	gag	gag
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu
				100					105				110		
gcg	ggg	gag	cgg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp
				115			120					125			
ggg	agg	ctt	gag	ggg	gag	ggg	agg	ctc	ctt	tgg	ctt	tac	cgg	gag	gtg
Gly	Arg	Leu	Glu	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val
				130			135				140				
gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val
				145			150			155			160		
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu
				165			170					175			
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro
				180			185			190					
ttc	aac	ctc	aat	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu
				195			200			205					
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser
				210			215			220					
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val
				225			230			235			240		
gag	aag	atc	ctg	cag	tac	cgg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr
				245			250			255					
att	gac	ccc	ttg	ccg	gac	ctc	ttc	cac	ccc	agg	acg	ggc	cgc	ctc	cac
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Phe	His	Pro	Arg	Thr	Gly	Arg	Leu	His
				260			265			270					
acc	cgc	ttc	aaa	cag	acg	gcc	acg	gcc	agg	cta	agt	agc	tcc		
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser
				275			280			285					

gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg		912
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		
290						295					300						
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gtc	ctg		960
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Val	Leu		
305						310					315				320		
gac	tat	agt	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac		1008
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp		
						325				330				335			
gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag		1056
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu		
						340			345					350			
acc	gcc	agc	tgg	atg	ttc	ggc	gtc	ccc	cgg	gag	gcc	gtg	gac	ccc	ctg		1104
Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro	Leu		
						355			360					365			
atg	cgc	cgg	gcg	gcc	aag	acc	atc	aac	ttc	ggg	gtc	ctc	tac	ggc	atg		1152
Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met		
						370			375					380			
tcg	gcc	cac	cgc	ctc	tcc	cag	gag	cta	gcc	atc	cct	tac	gag	gag	gcc		1200
Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala		
						385			390					395			400
cag	gcc	ttc	att	gag	cgc	tac	ttt	cag	agc	ttc	ccc	aag	gtg	cgg	gcc		1248
Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala		
						405				410				415			
tgg	att	gag	aag	acc	ctg	gag	gag	ggc	agg	agg	cgg	ggg	tac	gtg	gag		1296
Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Gly	Tyr	Val	Glu		
						420			425					430			
acc	ctc	ttc	ggc	cgc	cgc	cgc	tac	gtg	cca	gac	cta	gag	gcc	cgg	gtg		1344
Thr	Leu	Phe	Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val		
						435			440					445			
aag	agc	gtg	cgg	gag	gcf	gcc	gag	cgc	atg	gcc	tcc	aac	atg	ccc	gtc		1392
Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Ser	Asn	Met	Pro	Val		
						450			455					460			
cag	ggc	acc	gcc	gcc	gac	ctc	atg	aag	ctg	gct	atg	gtg	aag	ctc	ttc		1440
Gln	Gly	Thr	Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	Phe		
						465			470					475			480
ccc	agg	ctg	gag	gaa	atg	ggg	gcc	agg	atg	ctc	ctt	cag	gtc	cac	gac		1488
Pro	Arg	Leu	Glu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His	Asp		
						485				490				495			

gag	ctg	gtc	ctc	gag	gcc	cca	aaa	gag	ggg	gcg	gag	gcc	gtg	gcc	cg	1536
Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg	
500				505									510			
ctg	gcc	aag	gag	gtc	atg	gag	ggg	gtg	tat	ccc	ctg	gcc	gtg	ccc	ctg	1584
Leu	Ala	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	Leu	
515				520									525			
gag	gtg	gag	gtg	ggg	ata	ggg	gag	gac	tgg	ctc	tcc	gcc	aag	gag	g	1632
Glu	Val	Glu	Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	Ala	
530				535									540			
gcc	gc															1637
Ala																
545																
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<400>	77															
Ser	Pro	Lys	Ala	Leu	Glu	Glu	Ala	Pro	Trp	Pro	Pro	Pro	Glu	Gly	Ala	
1				5					10	.			15			
Phe	Val	Gly	Phe	Val	Leu	Ser	Arg	Lys	Glu	Pro	Met	Trp	Ala	Asp	Leu	
20								25					30			
Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu	
35								40					45			
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala	
50							55					60				
Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro	
65							70			75			80			
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr	
85								90					95			
Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu	
100								105					110			

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Phe His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Val Leu

305	310	315	320
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp			
325		330	335
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu			
340	345		350
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu			
355	360	365	
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met			
370	375	380	
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala			
385	390	395	400
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala			
405	410		415
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu			
420	425	430	
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			
435	440	445	
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Ser Asn Met Pro Val			
450	455	460	
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe			
465	470	475	480
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp			
485	490	495	
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg			
500	505	510	

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 78
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (1)..(1635)

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<400> 78
agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc      48
Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1           5           10          15

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ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

ctg gcc ctg gcc gcc agg ggg ggc cg³⁵ gtc cac cg⁴⁰ g gcc ccc gag
 Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
144
35 40 45

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cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc      192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
      50          55          60

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aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc      240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65          70           75           80

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ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc 288
 Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

acc ccc gag ggg gtg gcc cg_g cgc tac ggc ggg gag tgg acg gag gag 336
 Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

gag	agg	ccc	ctt	tcc	gtc	ctc	ttt	gcc	acc	atc	gtg		384			
Glu	Arg	Pro	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp				
115					120						125					
gag	agg	ccc	ctt	tcc	gtc	ctc	ttt	gcc	acc	atc	gtg		432			
Gly	Arg	Leu	Glu	Gly	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val		
130					135					140						
gag	agg	ccc	ctt	tcc	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg	480	
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val	
145					150				155			160				
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttt	tcc	ctg	gag	gtg	gcc	gag	528
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu	
165					170							175				
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc	576
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro	
180					185						190					
ttc	aac	ctc	aac	tcc	cg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag	624
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu	
195					200						205					
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc	672
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser	
210					215					220						
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg	720
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val	
225					230				235			240				
gag	aag	atc	ctg	cag	tac	cg	gag	ctc	acc	aag	ctg	aag	agc	acc	tac	768
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr	
245					250						255					
att	gac	ccc	ttt	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac	816
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His	
260					265						270					
acc	cgc	ttc	aac	cag	acg	gcc	acg	ggc	agg	cta	agt	acg	tcc		864	
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser	
275					280						285					
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg	912
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg	
290					295						300					
atc	cgc	cg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttt	gtg	gcc	ctg	960
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu		
305					310					315			320			

gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325	330	335	1008
gag aac ctg atc cg ^g gtc ttc cag gag ggg cg ^g gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340	345	350	1056
acc gcc agc tgg atg ttc ggc gtc ccc cga gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355	360	365	1104
atg cgc cg ^g gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370	375	380	1152
tcg gcc cac cg ^c ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385	390	395	1200
cag gcc ttc att gag cg ^c tac ttt cag agc ttc ccc aag gtg cg ^g gcc Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala 405	410	415	1248
tgg att gag aag acc ctg gag gag ggc agg agg cg ^g ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Gly Tyr Val Glu 420	425	430	1296
acc ctc ttc ggt cg ^c cg ^c tac gtg cca gac cta gag gcc cg ^g gtg Thr Leu Phe Gly Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435	440	445	1344
aag agc gtg cg ^g aag gcg gcc gag cg ^c aag gcc ttc aac atg ccc gtc Lys Ser Val Arg Lys Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val 450	455	460	1392
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe 465	470	475	1440
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp 485	490	495	1488
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cg ^g Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg 500	505	510	1536
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu			1584

515 520 525

gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg 1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

gcc gc 1637
Ala
545

<210> 79
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 79

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val

130

135

140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
 340 345 350 .

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
 385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
 420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Lys Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
545

<210> 80
<211> 1637
<212> DNA
<213> *Thermus aquaticus*

<220>
<221> CDS
<222> (1)..(1635)

gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg		480
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val		
145					150					155					160		
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag		528
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu		
					165				170					175			
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc		576
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro		
					180				185					190			
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag		624
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu		
					195			200				205					
cta	ggg	ctt	ccc	gcc	atc	gdc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc		672
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser		
					210			215			220						
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg		720
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val		
					225			230			235			240			
gag	aag	atc	ctg	cag	tac	cg	gag	ctc	acc	aag	ctg	aag	acg	acc	tac		768
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr		
					245			250				255					
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac		816
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His		
					260			265			270						
acc	cgc	ttc	aac	cag	acg	gcc	acg	gcc	acg	ggc	agg	cta	agt	acg	tcc		864
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser		
					275			280			285						
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg		912
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg		
					290			295			300						
atc	cgc	cgg	gcc	ttc	atc	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg		960
Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala	Leu		
					305			310			315			320			
gac	tat	agc	cag	ata	gag	ctc	agg	gtg	ctg	gcc	cac	ctc	tcc	ggc	gac		1008
Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly	Asp		
					325				330				335				
gag	aac	ctg	atc	cgg	gtc	ttc	cag	gag	ggg	cgg	gac	atc	cac	acg	gag		1056
Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr	Glu		

340	345	350	
acc gcc agc tgg atg ttc ggc gtc ccc Cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu			1104
355	360	365	
atg cgc cg ^g gc ^g gc ^c aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met			1152
370	375	380	
tcg gcc cac cg ^c ctc tcc cag gag cta gc ^c atc cct tac gag gag gc ^c Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala			1200
385	390	395	400
cag gcc ttc att gag cg ^c tac ttt cag a ^g c ttc ccc aag gtg cg ^g gc ^c Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala			1248
405	410	415	
tgg att gag aag acc ctg gag gag gc ^c a ^g g agg cg ^g ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu			1296
420	425	430	
acc ctc ttc ggc cg ^c cg ^c tac gtg c ^{ca} gac cta gag gc ^c cg ^g gt ^g Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			1344
435	440	445	
aag agc gtg cg ^g gag gc ^c gag cg ^c a ^g g gc ^c ttc aac atg ccc gt ^c Lys Ser Val Arg Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val			1392
450	455	460	
cag ggc acc gcc gac ctc atg aag ct ^g gct atg gtg aag ctc ttc Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe			1440
465	470	475	480
ccc agg ctg gag gaa atg ggg gc ^c agg at ^g ctc ctt cag gtc cac gac Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp			1488
485	490	495	
gag ctg gtc ctc gag gc ^c cca aaa gag ggg gc ^c gag gc ^c gt ^g gc ^c cg ^g Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg			1536
500	505	510	
ctg gcc aag gag gtc atg gag ggg gt ^g tat ccc ctg gc ^c gt ^g ccc ctg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu			1584
515	520	525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gc ^c aag gag gc ^c Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala			1632
530	535	540	
gcc gc			1637

Ala
545

<210> 81
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 81

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Arg Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 82
<211> 1637

<212> DNA

<213> Thermus aquaticus

<220>

<221> CDS

<222> (1)..(1635)

<400> 82

agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc	48
Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala	
1 5 10 15	
ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt	96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	
ctg gcc ctg gcc gcc agg ggg ggc cgg gtc cac ccg gcc ccc gag	144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
100 105 110	
gcg ggg gag cgg gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg	432
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag	528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	

165	170	175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro 180	185	190	576
tac aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu 195	200	205	624
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser 210	215	220	672
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val 225	230	235	720
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr 245	250	255	768
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His 260	265	270	816
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser 275	280	285	864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290	295	300	912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gtc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Val Leu 305	310	315	960
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325	330	335	1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340	345	350	1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355	360	365	1104
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg			1152

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met		
370	375	380
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc		1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala		
385	390	395
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cggt gcc		1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala		
405	410	415
tgg att gag aag acc ctg gag gag ggc agg agg cggt ggg tac gtg gag		1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu		
420	425	430
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcg cggt gtg		1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val		
435	440	445
aag agc gtg cggt gag gcg ggc gag cgc atg gcc ttc aac atg ccc gtc		1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val		
450	455	460
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc		1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe		
465	470	475
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac		1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp		
485	490	495
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cggt		1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg		
500	505	510
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg		1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu		
515	520	525
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg		1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala		
530	535	540
gcc gc		1637
Ala		
545		

<210> 83
<211> 545
<212> PRT

<213> Thermus aquaticus

<400> 83

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Val Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 84
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 84
 agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc 48
 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

ctg gcc ctg gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
 Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
 Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
 Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc 288
 Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag 336
 Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
 100 105 110

gcg ggg gag cgg gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg 384
 Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
 115 120 125

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg 432
 Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
 130 135 140

gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg 480
 Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
 145 150 155 160

cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag 528
 Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
 165 170 175

gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc 576
 Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
 180 185 190

ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag 624

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu			
195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc		672	
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser			
210	215	220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg		720	
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val			
225	230	235	240
gag aag atc ctg cag tac cg ^g gag ctc acc aag ctg aag agc acc tac		768	
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr			
245	250	255	
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac		816	
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His			
260	265	270	
acc cgc ttc aac cag acg gcc acg gcc agg cta agt agc tcc		864	
Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser			
275	280	285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg		912	
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg			
290	295	300	
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg		960	
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu			
305	310	315	320
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac		1008	
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp			
325	330	335	
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag		1056	
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu			
340	345	350	
acc gcc agc tgg atg ttc ggc gtc ccc cag gag gcc gtg gac ccc ctg		1104	
Thr Ala Ser Trp Met Phe Gly Val Pro Gln Glu Ala Val Asp Pro Leu			
355	360	365	
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg		1152	
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met			
370	375	380	
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc		1200	
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala			
385	390	395	400

cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cg ^g gcc	1248		
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala			
405	410	415	
tgg att gag aag acc ctg gag gag ggc agg agg cg ^g ggg tac gtg gag	1296		
Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Arg Gly Tyr Val Glu			
420	425	430	
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cg ^g gtg	1344		
Thr Leu Phe Gly Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			
435	440	445	
aag agc gtg cg ^g gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc	1392		
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val			
450	455	460	
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc	1440		
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe			
465	470	475	480
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac	1488		
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp			
485	490	495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cg ^g	1536		
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg			
500	505	510	
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg	1584		
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu			
515	520	525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg	1632		
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala			
530	535	540	
gcc gc	1637		
Ala			
545			

<210> 85
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 85

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp. Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Gln Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu

420

425

430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
 435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 86
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 86
 agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc 48
 Ser Pro Lys Ala Leu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

ttc gtg ggc ttt gtg ctt tcc cgcc aag gag ccc atg tgg gcc gat ctt 96

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu			
20	25	30	
ctg gcc ctg gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag			144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu			
35	40	45	
cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc			192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala			
50	55	60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc			240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro			
65	70	75	80
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc			288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr			
85	90	95	
acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag			336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu			
100	105	110	
gag ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg			384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp			
115	120	125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cgg gag gtg			432
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val			
130	135	140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg			480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val			
145	150	155	160
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag			528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu			
165	170	175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc			576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro			
180	185	190	
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag			624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu			
195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc			672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser			
210	215	220	

acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg		720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val		
225 230 235 240		
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac		768
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr		
245 250 255		
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac		816
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His		
260 265 270		
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc		864
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser		
275 280 285		
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg		912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg		
290 295 300		
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg		960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu		
305 310 315 320		
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac		1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp		
325 330 335		
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag		1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu		
340 345 350		
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg		1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu		
355 360 365		
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg		1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met		
370 375 380		
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc		1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala		
385 390 395 400		
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cgg gcc		1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala		
405 410 415		
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag		1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu		
420 425 430		

acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cggtg		1344	
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			
435	440	445	
aag agc gtg cggttgg gag gcgcagg cgc aag gcc ttcaacatgc ccc gtc		1392	
Lys Ser Val Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val			
450	455	460	
cag ggc acc gcc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttcc		1440	
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe			
465	470	475	480
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac		1488	
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp			
485	490	495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cggt		1536	
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg			
500	505	510	
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg		1584	
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu			
515	520	525	
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg		1632	
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala			
530	535	540	

gcc gc		1637
Ala		
545		

<210> 87
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 87

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala			
1	5	10	15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu		
20	25	30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu		
35	40	45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr

245

250

255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Lys Ala Phe Asn Met Pro Val
 450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 88
 <211> 1637
 <212> DNA
 <213> Thermus aquaticus

<220>
 <221> CDS
 <222> (1)..(1635)

<400> 88
 agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc 48
 Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

ctg gcc ctg gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
 Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cg ^g ggg ctt ctc gcc		192	
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala			
50	55	60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc		240	
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro			
65	70	75	80
ggc gac gac ccc atg ctc ctc 'gcc tac ctc ctg gac cct tcc aac acc		288	
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr			
85	90	95	
acc ccc gag ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg acg gag gag		336	
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu			
100	105	110	
gcg ggg gag cgg gcc gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg		384	
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp			
115	120	125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cg ^g gag gtg		432	
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val			
130	135	140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg		480	
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val			
145	150	155	160
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag		528	
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu			
165	170	175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc		576	
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro			
180	185	190	
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag		624	
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu			
195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc		672	
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser			
210	215	220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg		720	
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val			
225	230	235	240
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag acg acc tac		768	
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr			
245	250	255	

att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgcc ctc cac Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His 260 265 270	816
acc cgc ttc aac cag acg gcc acg gcc agg cta agt agc tcc Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser 275 280 285	864
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg 290 295 300	912
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu 305 310 315 320	960
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp 325 330 335	1008
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu 340 345 350	1056
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu 355 360 365	1104
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met 370 375 380	1152
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala 385 390 395 400	1200
cag gcc ttc att gag cgc aac ttt cag agc ttc ccc aag gtg cgg gcc Gln Ala Phe Ile Glu Arg Asn Phe Gln Ser Phe Pro Lys Val Arg Ala 405 410 415	1248
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu 420 425 430	1296
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val 435 440 445	1344
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val	1392

450

455

460

cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc 1440
 Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
 465 470 475 480

ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac 1488
 Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg 1536
 Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg 1584
 Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg 1632
 Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

gcc gc 1637
 Ala
 545

<210> 89
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 89

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro

65

70

75

80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Asn Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 90
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 90

agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc 48
 Ser Pro Lys Ala Leu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

tgc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt 96
 Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

ctg gcc ctg gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag 144
 Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc 192
 Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc 240
 Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	
acc ccc gag ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
100 105 110	
g ^c g ^g g ^g c ^g g ^c g ^c c ^t t ^c g ^a g ^g c ^t c ^t g ^c a ^a c ^t g ^t g ^g	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	
g ^g g ^g c ^t g ^a g ^g g ^g g ^a g ^g c ^t c ^t t ^g c ^t t ^a c ^g g ^a g ^t g ^t	432
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	
g ^a g ^g c ^c c ^t t ^c g ^c t ^g c ^t g ^c c ^a c ^t g ^a g ^g g ^t g ^t	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	
c ^g c ^t g ^a g ^t g ^c t ^a t ^c a ^g g ^c t ^t t ^c c ^t g ^a g ^t g ^t g ^c g ^a	528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	
165 170 175	
g ^a a ^t c ^g c ^c c ^t g ^a g ^g g ^t c ^t c ^g c ^t g ^c g ^g c ^a c ^c	576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	
180 185 190	
t ^t c ^a c ^t a ^a t ^c c ^g g ^a c ^a g ^t g ^c t ^c t ^t g ^a c ^a g ^g	624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	
195 200 205	
c ^t a ^g g ^g c ^t t ^c c ^c g ^c a ^t c ^g a ^a g ^c g ^a a ^a g ^g c ^c t ^c	672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser	
210 215 220	
acc a ^g c ^g g ^c g ^t c ^t g ^a g ^g g ^c c ^t c ^g g ^a g ^c c ^a c ^c a ^t c ^g	720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val	
225 230 235 240	
g ^a a ^a a ^t c ^t g ^a t ^c c ^g g ^a g ^t c ^t a ^c a ^a g ^t a ^a g ^c a ^c t ^c	768
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr	
245 250 255	
att g ^a c ^c t ^t g ^c g ^a c ^t a ^t c ^a c ^c a ^g a ^c g ^g c ^c c ^t c ^a	816
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His	
260 265 270	
acc c ^g t ^t a ^a c ^a g ^a a ^c g ^c a ^c g ^g c ^a g ^g c ^t a ^t a ^g a ^c t ^c	864
Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser	

275

280

285

gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg			912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg			
290	295	300	
atc cgc cggttccatcgccgaggggcttgtgtgccctg			960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu			
305	310	315	320
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac			1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp			
325	330	335	
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag			1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu			
340	345	350	
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg			1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu			
355	360	365	
atg cgc cgg gcg gcc aag acc atc aac ttc ggg gtc ctc tac ggc atg			1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met			
370	375	380	
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc			1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala			
385	390	395	400
cag gcc ttc att gag cgc tgc ttt cag agc ttc ccc aag gtg cgg gcc			1248
Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala			
405	410	415	
tgg att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag			1296
Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Arg Gly Tyr Val Glu			
420	425	430	
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg			1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			
435	440	445	
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc			1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val			
450	455	460	
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc			1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe			
465	470	475	480
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac			1488

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
 485 490 495

gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cg
 Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
 500 505 510

ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg
 Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg
 Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

gcc gc
 Ala
 545

<210> 91
 <211> 545
 <212> PRT
 <213> Thermus aquaticus

<400> 91

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
 1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
 20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
 35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
 50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
 65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
 85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
 515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
 530 535 540

Ala
 545

<210> 92
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>
<221> CDS
<222> (1)..(1635)

<400> 92

agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc	48
Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala	
1 5 10 15	

ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt	96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	

ctg gcc ctg gcc gcc agg ggg ggc cgg gtc cac cgg gcc ccc gag	144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	

cct tat aaa gcc ctc agg gac ctg aag gag gcg cgg ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	

acc ccc gag ggg gtg gcc cgg cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	

100

105

110

gag	agg	cgg	gag	cg	gcc	gcc	ctt	tcc	gag	agg	ctc	ttc	gcc	aac	ctg	tgg		384
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp			
115							120							125				
ggg	agg	ctt	gag	ggg	gag	agg	ctc	ctt	tgg	ctt	tac	cg	gag	gtg			432	
Gly	Arg	Leu	Glu	Gly	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu	Val				
130							135							140				
gag	agg	ccc	ctt	tcc	gct	gtc	ctg	gcc	cac	atg	gag	gcc	acg	ggg	gtg		480	
Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly	Val			
145							150							155			160	
cgc	ctg	gac	gtg	gcc	tat	ctc	agg	gcc	ttg	tcc	ctg	gag	gtg	gcc	gag		528	
Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala	Glu			
165							170							175				
gag	atc	gcc	cgc	ctc	gag	gcc	gag	gtc	ttc	cgc	ctg	gcc	ggc	cac	ccc		576	
Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His	Pro			
180							185							190				
ttc	aac	ctc	aac	tcc	cgg	gac	cag	ctg	gaa	agg	gtc	ctc	ttt	gac	gag		624	
Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp	Glu			
195							200							205				
cta	ggg	ctt	ccc	gcc	atc	ggc	aag	acg	gag	aag	acc	ggc	aag	cgc	tcc		672	
Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg	Ser			
210							215							220				
acc	agc	gcc	gcc	gtc	ctg	gag	gcc	ctc	cgc	gag	gcc	cac	ccc	atc	gtg		720	
Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile	Val			
225							230							235			240	
gag	aag	atc	ctg	cag	tac	cg	gag	ctc	acc	aag	ctg	aag	acg	acc	tac		768	
Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr	Tyr			
245							250							255				
att	gac	ccc	ttg	ccg	gac	ctc	atc	cac	ccc	agg	acg	ggc	cgc	ctc	cac		816	
Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	Pro	Arg	Thr	Gly	Arg	Leu	His			
260							265							270				
acc	cgc	ttc	aac	cag	acg	gcc	acg	ggc	agg	cta	agt	acg	tcc			864		
Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser	Ser			
275							280							285				
gat	ccc	aac	ctc	cag	aac	atc	ccc	gtc	cgc	acc	ccg	ctt	ggg	cag	agg		912	
Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln	Arg			
290							295							300				
atc	cgc	cgg	gcc	ttc	aac	gcc	gag	gag	ggg	tgg	cta	ttg	gtg	gcc	ctg		960	

Ile Arg Arg Ala Phe Asn Ala Glu Glu Gly Trp Leu Leu Val Ala Leu			
305	310	315	320
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac			1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp			
325	330	335	
gag aac ctg atc cggttc cag gag ggg agg gac atc cac acg gag			1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu			
340	345	350	
acc gcc agc tgg atg ttc ggc gtc ccc cggttc gag gac atc ccc ctg			1104
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu			
355	360	365	
atg cgc cggttc ggc aag acc atc aac ttc ggg gtc ctc tac ggc atg			1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met			
370	375	380	
tcg gcc cac cgcc tcc cag gag cta gcc atc cct tac gag gag gcc			1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala			
385	390	395	400
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cggttc ggc			1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala			
405	410	415	
tgg att gag aag acc ctg gag gag ggc agg agg cggttc gag tac gtg gag			1296
Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Gly Tyr Val Glu			
420	425	430	
acc ctc ttc ggc cgcc tac gtg cca gac cta gag gcc cggttc			1344
Thr Leu Phe Gly Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val			
435	440	445	
aag agc gtg cggttc gag ggc gag cgc atg gcc ttc aac atg ccc gtc			1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val			
450	455	460	
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg aag ctc ttc			1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe			
465	470	475	480
ccc agg ctg gag gaa atg ggg ggc agg atg ccc ctt cag gtc cac gac			1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Pro Leu Gln Val His Asp			
485	490	495	
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cggttc			1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg			
500	505	510	

ctg	gcc	aag	gag	gtc	atg	gag	ggg	gtg	tat	ccc	ctg	gcc	gtg	ccc	ctg	1584
Leu	Ala	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	Leu	
515															525	
gag	gtg	aag	gtg	ggg	ata	ggg	gag	gac	tgg	c c	tcc	gcc	aag	gag	gcg	1632
Glu	Val	Lys	Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	Ala	
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gcc	gc															1637
Ala																
545																
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20								25							30	
Leu	Ala	Leu	Ala	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro	Glu	
35							40								45	
Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Glu	Ala	Arg	Gly	Leu	Leu	Ala	
50						55									60	
Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro	Pro	
65							70				75				80	
Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn	Thr	
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Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Glu	Trp	Thr	Glu	Glu	
100								105							110	
Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Glu	Arg	Leu	Phe	Ala	Asn	Leu	Trp	
115							120								125	

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Asn Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Pro Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

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535

540

Ala
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<212> DNA
<213> Thermus aquaticus

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<222> (1)..(1635)

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Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	

ctg gcc ctg gcc gcc agg ggg ggc cg ^g gtc cac cg ^g gcc ccc gag	144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	

cct tat aaa gcc ctc agg gac ctg aag gag gc ^g cg ^g ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	

aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt ggc ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	

ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	

acc ccc gag ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
100 105 110	

gc ^g ggg gag cg ^g gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cg ^g gag gtg	432
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Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val			
130	135	140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg			480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val			
145	150	155	160
cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag			528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu			
165	170	175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc			576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro			
180	185	190	
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gag			624
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu			
195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc gg c aag cgc tcc			672
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser			
210	215	220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc ca c ccc atc gtg			720
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val			
225	230	235	240
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Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr			
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att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac			816
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His			
260	265	270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg ct a agt agc tcc			864
Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser			
275	280	285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg			912
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg			
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atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg			960
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu			
305	310	315	320
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac			1008
Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp			
325	330	335	

gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag		1056
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu		
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Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu		
355	360	365
atg cgc cgg gcg aag acc atc aac ttc ggg gtc ctc tac ggc atg		1152
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met		
370	375	380
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc		1200
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala		
385	390	395
cag gcc ttc att gag cgc tgc ttt cag agc ttc ccc aag gtg cgg gcc		1248
Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala		
405	410	415
tgg .att gag aag acc ctg gag gag ggc agg agg cgg ggg tac gtg gag		1296
Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Gly Tyr Val Glu		
420	425	430
acc ctc ttc ggc cgc cgc tac gtg cca gac cta gag gcc cgg gtg		1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val		
435	440	445
aag agc gtg cgg gag gcg gcc gag cgc atg gcc ttc aac atg ccc gtc		1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val		
450	455	460
cag ggc acc gcc gac ctc atg aag ctg gct atg gtg gag ctc ttc		1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Glu Leu Phe		
465	470	475
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac		1488
Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp		
485	490	495
gag ctg gtc ctc gag gcc cca aaa gag ggg gcg gag gcc gtg gcc cgg		1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg		
500	505	510
ctg gcc aag gag gtc atg gag ggg gtg tat ccc ctg gcc gtg ccc ctg		1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu		
515	520	525
gag gtg gag gtg ggg ata ggg gag gac tgg ctc tcc gcc aag gag gcg		1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala		
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gcc gc
Ala
545

1637

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<212> PRT
<213> Thermus aquaticus

<400> 95

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Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu

355

360

365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Cys Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Glu Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
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Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

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<213> Thermus aquaticus

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Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
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Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
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Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	

acc ccc gag ggg gtg gcc cggt cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
100 105 110	

cggt ggg gag cggt gcc ctt tcc gag agg ctc ttc gcc aac ctg tg g	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	

ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac ccg gag gt g	432
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	

gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gt g	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	

cgc ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag	Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	528	
165	170	175	
gag atc gcc cgc ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc	Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	576	
180	185	190	
ttc aac ctc aac tcc cgg gac cag ctg gaa agg gtc ctc ttt gac gaa	Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu	624	
195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc	Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser	672	
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225	230	235	240
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac	Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr	768	
245	250	255	
att gac ccc ttg ccg ggc ctc atc cac ccc agg acg ggc cgc ctc cac	Ile Asp Pro Leu Pro Gly Leu Ile His Pro Arg Thr Gly Arg Leu His	816	
260	265	270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc	Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser	864	
275	280	285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg	Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg	912	
290	295	300	
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305	310	315	320
gac tat agc cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac	Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp	1008	
325	330	335	
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag	Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu	1056	
340	345	350	
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355	360	365	

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Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly	Met										
370							375																		
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Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glu	Glu	Ala										
385							390																		
cag	gcc	tt	c	att	g	ag	cg	tc	tt	c	ag	ac	tt	cc	a	ag	gt	cg	gg	gc	1248				
Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg	Ala										
405																410									
tgg	att	g	ag	a	ag	ac	ct	g	ag	gg	gc	ag	ag	cg	gg	gg	tg	tg	tg	g	ag	1296			
Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Arg	Gly	Tyr	Tyr	Val	Gl	u							
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																	425								
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Thr	Leu	Phe	Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg	Val										
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																	440								
aag	agc	gt	cg	g	ag	g	cg	gc	g	ag	cg	at	g	cc	tt	cc	gg	gt	1392						
Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro	Val										
																	450								
																	455								
cag	ggc	ac	g	cc	g	cc	g	ac	ct	at	a	ag	ct	gt	at	gt	a	ct	tt	1440					
Gln	Gly	Thr	Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu	Phe										
																	465								
																	470								
																	475								
ccc	agg	ct	g	ag	g	aa	at	gg	gc	ag	at	ct	ct	tt	ca	at	ca	c	ga	1488					
Pro	Arg	Leu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Ile	His	Asp											
																	485								
																	490								
																	495								
gag	ct	gt	ct	g	ag	g	cc	cc	aa	g	ag	gg	gg	g	cg	g	ag	gg	cc	cg	1536				
Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Gly	Ala	Glu	Ala	Val	Ala	Arg										
																	500								
																	505								
ct	g	cc	a	ag	g	tc	at	g	ag	gg	gt	at	cc	ct	g	cc	gt	cc	ct	1584					
Leu	Ala	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro	Leu										
																	515								
																	520								
																	525								
gag	gt	g	ag	gt	gg	at	gg	g	ag	g	ac	t	gg	ct	t	cc	gc	a	ag	g	cg	1632			
Glu	Val	Glu	Val	Gly	Ile	Gly	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu	Ala									
																	530								
																	535								
																	540								
gc	gc																								
Ala																									
545																									

<211> 545

<212> PRT

<213> Thermus aquaticus

<400> 97

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala
1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met. Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro

180

185

190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Gly Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Ile His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 98
<211> 1637
<212> DNA
<213> Thermus aquaticus

<220>

<221> CDS

<222> (1)..(1635)

<400> 98

agc ccc aag gcc ctg gag gag gcc ccc tgg ccc ccg ccg gaa ggg gcc	48
Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala	
1 5 10 15	
ttc gtg ggc ttt gtg ctt tcc cgc aag gag ccc atg tgg gcc gat ctt	96
Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu	
20 25 30	
ctg gcc ctg gcc gcc agg ggg ggc cg ^g gtc cac cg ^g gcc ccc gag	144
Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu	
35 40 45	
cct tat aaa gcc ctc agg gac ctg aag gag g ^{cg} cg ^g ggg ctt ctc gcc	192
Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala	
50 55 60	
aaa gac ctg agc gtt ctg gcc ctg agg gaa ggc ctt gg ^c ctc ccg ccc	240
Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro	
65 70 75 80	
ggc gac gac ccc atg ctc ctc gcc tac ctc ctg gac cct tcc aac acc	288
Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr	
85 90 95	
acc ccc gag ggg gtg gcc cg ^g cgc tac ggc ggg gag tgg acg gag gag	336
Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu	
100 105 110	
gcg ggg gag cg ^g gcc ctt tcc gag agg ctc ttc gcc aac ctg tgg	384
Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp	
115 120 125	
ggg agg ctt gag ggg gag gag agg ctc ctt tgg ctt tac cg ^g gag gtg	432
Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val	
130 135 140	
gag agg ccc ctt tcc gct gtc ctg gcc cac atg gag gcc acg ggg gtg	480
Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val	
145 150 155 160	
cg ^c ctg gac gtg gcc tat ctc agg gcc ttg tcc ctg gag gtg gcc gag	528
Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu	
165 170 175	
gag atc gcc cg ^c ctc gag gcc gag gtc ttc cgc ctg gcc ggc cac ccc	576
Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro	
180 185 190	

ttc aac ctc aac tcc cg ^g gac cag ctg gaa agg gtc ctc ttt gac gag		624	
Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu			
195	200	205	
cta ggg ctt ccc gcc atc ggc aag acg gag aag acc ggc aag cgc tcc		672	
Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser			
210	215	220	
acc agc gcc gcc gtc ctg gag gcc ctc cgc gag gcc cac ccc atc gtg		720	
Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val			
225	230	235	240
gag aag atc ctg cag tac cgg gag ctc acc aag ctg aag agc acc tac		768	
Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr			
245	250	255	
att gac ccc ttg ccg gac ctc atc cac ccc agg acg ggc cgc ctc cac		816	
Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His			
260	265	270	
acc cgc ttc aac cag acg gcc acg gcc acg ggc agg cta agt agc tcc		864	
Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser			
275	280	285	
gat ccc aac ctc cag aac atc ccc gtc cgc acc ccg ctt ggg cag agg		912	
Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg			
290	295	300	
atc cgc cgg gcc ttc atc gcc gag gag ggg tgg cta ttg gtg gcc ctg		960	
Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu			
305	310	315	320
gac tat aac cag ata gag ctc agg gtg ctg gcc cac ctc tcc ggc gac		1008	
Asp Tyr Asn Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp			
325	330	335	
gag aac ctg atc cgg gtc ttc cag gag ggg cgg gac atc cac acg gag		1056	
Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu			
340	345	350	
acc gcc agc tgg atg ttc ggc gtc ccc cgg gag gcc gtg gac ccc ctg		1104	
Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu			
355	360	365	
atg cgc cgg gc ^g aag acc atc aac ttc ggg gtc ctc tac ggc atg		1152	
Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met			
370	375	380	
tcg gcc cac cgc ctc tcc cag gag cta gcc atc cct tac gag gag gcc		1200	
Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala			

385	390	395	400	
cag gcc ttc att gag cgc tac ttt cag agc ttc ccc aag gtg cg ^g gcc				1248
Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala				
405	410	415		
tgg att gag aag acc ctg gag gag ggc agg agg cg ^g ggg tac gtg gag				1296
Trp Ile Glu Lys Thr Leu Glu Gly Arg Arg Gly Tyr Val Glu				
420	425	430		
acc ctc ttc ggc cgc cgc tac gtg cca g ac cta gag gcc cg ^g gtg				1344
Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val				
435	440	445		
aag agc gtg cg ^g gag g ^{cg} gcc gag cgc atg g cc ttc aac atg ccc gtc				1392
Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val				
450	455	460		
cag ggc acc gcc gac ctc atg aag ctg g ct atg gtg aag ctc ttc				1440
Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe				
465	470	475	480	
ccc agg ctg gag gaa atg ggg gcc agg atg ctc ctt cag gtc cac gac				1488
Pro Arg Leu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp				
485	490		495	
gag ctg gtc .ctc gag gcc cca aaa gag ggg g c g gag gcc gtg gcc cg ^g				1536
Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg				
500	505		510	
ctg gcc aag gag gtc atg gag ggg gtg tat c c c ctg gcc gtg tcc ctg				1584
Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Ser Leu				
515	520		525	
gag gtg gag gtg ggg ata ggg gag gac tgg c tc tcc gcc aag gag g ^{cg}				1632
Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala				
530	535	540		
gcc gc				1637
Ala				
545				

<210> 99
<211> 545
<212> PRT
<213> Thermus aquaticus

<400> 99

Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly Ala

1 5 10 15

Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp Leu
20 25 30

Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro Glu
35 40 45

Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu Ala
50 55 60

Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro Pro
65 70 75 80

Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn Thr
85 90 95

Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu Glu
100 105 110

Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu Trp
115 120 125

Gly Arg Leu Glu Gly Glu Glu Arg Leu Leu Trp Leu Tyr Arg Glu Val
130 135 140

Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly Val
145 150 155 160

Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala Glu
165 170 175

Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His Pro
180 185 190

Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp Glu
195 200 205

Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg Ser
210 215 220

Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile Val
225 230 235 240

Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr Tyr
245 250 255

Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu His
260 265 270

Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser Ser
275 280 285

Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln Arg
290 295 300

Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala Leu
305 310 315 320

Asp Tyr Asn Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly Asp
325 330 335

Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr Glu
340 345 350

Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro Leu
355 360 365

Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly Met
370 375 380

Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu Ala
385 390 395 400

Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg Ala
405 410 415

Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val Glu
420 425 430

Thr Leu Phe Gly Arg Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg Val
435 440 445

Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro Val
450 455 460

Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu Phe
465 470 475 480

Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His Asp
485 490 495

Glu Leu Val Leu Glu Ala Pro Lys Glu Gly Ala Glu Ala Val Ala Arg
500 505 510

Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Ser Leu
515 520 525

Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu Ala
530 535 540

Ala
545

<210> 100
<211> 832
<212> PRT
<213> Thermus aquaticus

<400> 100

Met Arg Gly Met Leu Pro Leu Phe Glu Pro Lys Gly Arg Val Leu Leu
1 5 10 15

Val Asp Gly His His Leu Ala Tyr Arg Thr Phe His Ala Leu Lys Gly
20 25 30

Leu Thr Thr Ser Arg Gly Glu Pro Val Gln Ala Val Tyr Gly Phe Ala
35 40 45

Lys Ser Leu Leu Lys Ala Leu Lys Glu Asp Gly Asp Ala Val Ile Val
50 55 60

Val Phe Asp Ala Lys Ala Pro Ser Phe Arg His Glu Ala Tyr Gly Gly
65 70 75 80

Tyr Lys Ala Gly Arg Ala Pro Thr Pro Glu Asp Phe Pro Arg Gln Leu
85 90 95

Ala Leu Ile Lys Glu Leu Val Asp Leu Leu Gly Leu Ala Arg Leu Glu
100 105 110

Val Pro Gly Tyr Glu Ala Asp Asp Val Leu Ala Ser Leu Ala Lys Lys
115 120 125

Ala Glu Lys Glu Gly Tyr Glu Val Arg Ile Leu Thr Ala Asp Lys Asp
130 135 140

Leu Tyr Gln Leu Leu Ser Asp Arg Ile His Val Leu His Pro Glu Gly
145 150 155 160

Tyr Leu Ile Thr Pro Ala Trp Leu Trp Glu Lys Tyr Gly Leu Arg Pro
165 170 175

Asp Gln Trp Ala Asp Tyr Arg Ala Leu Thr Gly Asp Glu Ser Asp Asn
180 185 190

Leu Pro Gly Val Lys Gly Ile Gly Glu Lys Thr Ala Arg Lys Leu Leu
195 200 205

Glu Glu Trp Gly Ser Leu Glu Ala Leu Leu Lys Asn Leu Asp Arg Leu
210 215 220

Lys Pro Ala Ile Arg Glu Lys Ile Leu Ala His Met Asp Asp Leu Lys
225 230 235 240

Leu Ser Trp Asp Leu Ala Lys Val Arg Thr Asp Leu Pro Leu Glu Val
245 250 255

Asp Phe Ala Lys Arg Arg Glu Pro Asp Arg Glu Arg Leu Arg Ala Phe
260 265 270

Leu Glu Arg Leu Glu Phe Gly Ser Leu Leu His Glu Phe Gly Leu Leu
275 280 285

Glu Ser Pro Lys Ala Leu Glu Glu Ala Pro Trp Pro Pro Pro Glu Gly
290 295 300

Ala Phe Val Gly Phe Val Leu Ser Arg Lys Glu Pro Met Trp Ala Asp
305 310 315 320

Leu Leu Ala Leu Ala Ala Arg Gly Gly Arg Val His Arg Ala Pro
325 330 335

Glu Pro Tyr Lys Ala Leu Arg Asp Leu Lys Glu Ala Arg Gly Leu Leu
340 345 350

Ala Lys Asp Leu Ser Val Leu Ala Leu Arg Glu Gly Leu Gly Leu Pro
355 360 365

Pro Gly Asp Asp Pro Met Leu Leu Ala Tyr Leu Leu Asp Pro Ser Asn
370 375 380

Thr Thr Pro Glu Gly Val Ala Arg Arg Tyr Gly Gly Glu Trp Thr Glu
385 390 395 400

Glu Ala Gly Glu Arg Ala Ala Leu Ser Glu Arg Leu Phe Ala Asn Leu
405 410 415

Trp Gly Arg Leu Glu Gly Glu Arg Leu Leu Trp Leu Tyr Arg Glu
420 425 430

Val Glu Arg Pro Leu Ser Ala Val Leu Ala His Met Glu Ala Thr Gly

435

440

445

Val Arg Leu Asp Val Ala Tyr Leu Arg Ala Leu Ser Leu Glu Val Ala
450 455 460

Glu Glu Ile Ala Arg Leu Glu Ala Glu Val Phe Arg Leu Ala Gly His
465 470 475 480

Pro Phe Asn Leu Asn Ser Arg Asp Gln Leu Glu Arg Val Leu Phe Asp
485 490 495

Glu Leu Gly Leu Pro Ala Ile Gly Lys Thr Glu Lys Thr Gly Lys Arg
500 505 510

Ser Thr Ser Ala Ala Val Leu Glu Ala Leu Arg Glu Ala His Pro Ile
515 520 525

Val Glu Lys Ile Leu Gln Tyr Arg Glu Leu Thr Lys Leu Lys Ser Thr
530 535 540

Tyr Ile Asp Pro Leu Pro Asp Leu Ile His Pro Arg Thr Gly Arg Leu
545 550 555 560

His Thr Arg Phe Asn Gln Thr Ala Thr Ala Thr Gly Arg Leu Ser Ser
565 570 575

Ser Asp Pro Asn Leu Gln Asn Ile Pro Val Arg Thr Pro Leu Gly Gln
580 585 590

Arg Ile Arg Arg Ala Phe Ile Ala Glu Glu Gly Trp Leu Leu Val Ala
595 600 605

Leu Asp Tyr Ser Gln Ile Glu Leu Arg Val Leu Ala His Leu Ser Gly
610 615 620

Asp Glu Asn Leu Ile Arg Val Phe Gln Glu Gly Arg Asp Ile His Thr
625 630 635 640

Glu Thr Ala Ser Trp Met Phe Gly Val Pro Arg Glu Ala Val Asp Pro
645 650 655

Leu Met Arg Arg Ala Ala Lys Thr Ile Asn Phe Gly Val Leu Tyr Gly
660 665 670

Met Ser Ala His Arg Leu Ser Gln Glu Leu Ala Ile Pro Tyr Glu Glu
675 680 685

Ala Gln Ala Phe Ile Glu Arg Tyr Phe Gln Ser Phe Pro Lys Val Arg
690 695 700

Ala Trp Ile Glu Lys Thr Leu Glu Glu Gly Arg Arg Arg Gly Tyr Val
705 710 715 720

Glu Thr Leu Phe Gly Arg Arg Tyr Val Pro Asp Leu Glu Ala Arg
725 730 735

Val Lys Ser Val Arg Glu Ala Ala Glu Arg Met Ala Phe Asn Met Pro
740 745 750

Val Gln Gly Thr Ala Ala Asp Leu Met Lys Leu Ala Met Val Lys Leu
755 760 765

Phe Pro Arg Leu Glu Glu Met Gly Ala Arg Met Leu Leu Gln Val His
770 775 780

Asp Glu Leu Val Leu Glu Ala Pro Lys Glu Arg Ala Glu Ala Val Ala
785 790 795 800

Arg Leu Ala Lys Glu Val Met Glu Gly Val Tyr Pro Leu Ala Val Pro
805 810 815

Leu Glu Val Glu Val Gly Ile Gly Glu Asp Trp Leu Ser Ala Lys Glu
820 825 830

<210> 101

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 101

ggatggaacc gctggagagc aactcg

25

<210> 102

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 102

gatctctcttg atttttcttg cgtcg

25

<210> 103

<211> 34

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic RNA

<400> 103

aagccuacga cuccgaacug accgugcuac caau

34

<210> 104

<211> 34

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic RNA

<400> 104

aagccuacua cuccgaacug accgugcuac caau

34

<210> 105

<211> 34

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic RNA

<400> 105

aagccuacaa cuccgaacug accgugcuac caau

34

<210> 106

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 106

atggtagca cggtcagttc ggagt

25